DR11-C

DEVICE REGISTER TEST

MD-11-DZDRC-G

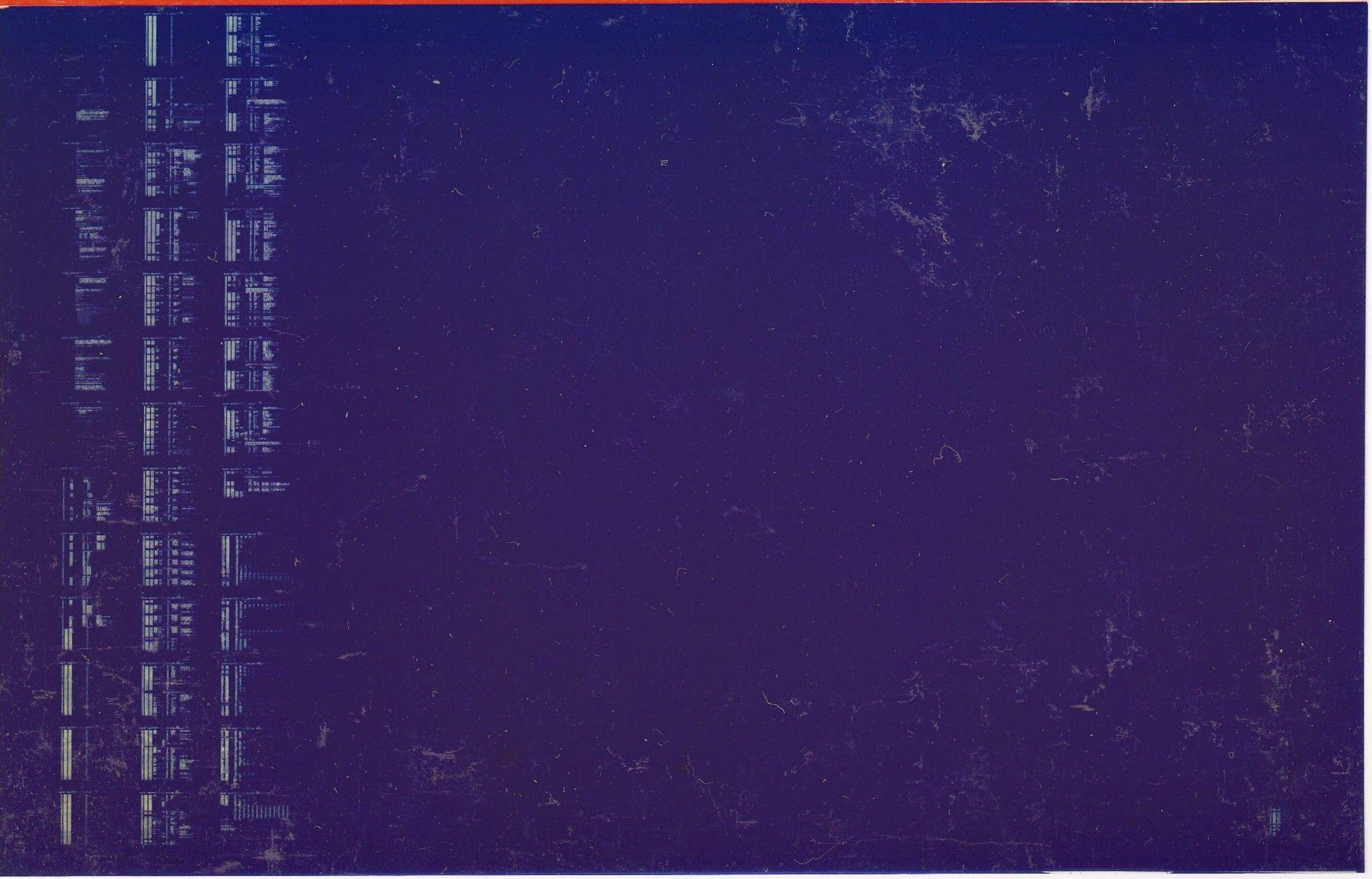
EP-DZDRC-G-DL-A

FICHE 1 OF 1

AUG 1977

digital

MADE IN USA



EJF1DCDCABSEQ 00010000 770720 PDP10 411 : HDR1DZDRCGSEQ 00010000 770720

.REM %

IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZDRC-G-D

PRODUCT NAME: DR11C DEVICE REGISTER TEST

DATE RELEASED : APRIL, 1977

MAINTAINER: DIAGNOSTIC GROUP

AUTHOR: JOHN HITTELL

1. ABSTRACT

THIS IS A LOGIC TEST OF THE DR11C. FOR THIS TEST TO OPERATE
A SPECIAL MAINTENANCE CABLE MUST BE CONNECTED (BC08R).
THIS TEST WILL CHECK UP TO 32 SEQUENTIAL DR11C'S.

2. REQUIREMENTS

2.1 EQUIPMENT

PDP-11 STANDARD COMPUTER

DR11C

BC08R FOR EACH DR11C

2.2 STORAGE

2.2.1 PROGRAM STORAGE - THE ROUTINE USES MEMORY
FROM 0000 TO 5200.

3. LOADING PROCEDURE

3.1 METHOD

ABSOLUTE LOADER

4. STARTING PROCEDURE

4.1 CONTROL SWITCH SETTING

FOR SWITCHLESS PROCESSORS, THE PROGRAM WILL USE THE
CONTENTS OF LOCATION 176 AS THE VALUE OF THE SWITCHES
IF NO HARDWARE SWITCH REGISTER IS FOUND. THE PROGRAM
ALLOWS THE DYNAMIC LOADING OF THE SOFTWARE SWITCH REGISTER
THROUGH THE CONTROL G (^G) ROUTINE. LOCATION 174
WILL BE USED AS THE SOFTWARE DISPLAY REGISTER.

STARTING AT SA 200 ALL SWITCHES SHOULD BE DOWN OR ZERO.
(IF NOT ZERO, BIT 0 TO 8 WILL BE STARTING VECTOR.)

4.2 STARTING ADDRESS OR ADDRESSES

(A) 200 = START OF TEST--FOR NORMAL TESTING
(B) 204 = SPECIAL ENTRANCE --FOR TESTING UNIQUE DR11C
(C) 210 = RESTART--FOR STARTING AFTER SHUT DOWN

4.3 PROGRAM AND/OR OPERATOR ACTION

LOAD PROGRAM INTO MEMORY.

E01

SET SWITCH REGISTER TO STARTING ADDRESS.
LOAD ADDRESS.
PRESS START.
THE PROGRAM WILL STAY IN SECTION AND LOOP.

4.3.1 FOR SPECIAL ENTRANCE - SA204

1ST HALT SET SWITCH REGISTER EQUAL TO CSR ADDRESS OF DR11C
PRESS CONTINUE
2ND HALT SET SWITCH REGISTER EQUAL TO VECTOR ADDRESS OF DR11C
PRESS CONTINUE
RAISE SWITCH 10 TO "1" TO INHIBIT SEQUENCING TO NEXT DR11C

5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

5.1.1 AT SA 200 .. THE INSTRUCTION AND LOGIC TEST.
WITH ALL SWITCHES DOWN THE PROGRAM WILL PRINT
OUT ON ERRORS AND CONTINUE IN TEST. (* WILL
BE PRINTED AT COMPLETION OF TESTING EACH DR11C)

5.1.2 SWITCH SETTINGS ARE

SW15 = 1 OR UP ... HALT ON ERROR
SW14 = 1 OR UP ... SCOPE LOOP
SW13 = 1 OR UP ... INHIBIT PRINTOUT
SW12 = 1 OR UP ... NOT USED
SW11 = 1 OR UP ... INHIBIT ITERATION LOOP
SW10 = 1 OR UP ... DO NOT ADVANCE TO NEXT DR11C
SW09 = 1 OR UP ... INHIBIT PRINTOUT OF DEVICE TESTED.

5.1.3

5.2. SUBROUTINE STRACTS

5.2.1 BEGIN SA 200

5.2.2 SCOPE

THIS SUBROUTINE CALL IS PLACED BETWEEN EACH SUBTEST
IN THE INSTRUCTION SECTION. IT RECORDS THE STARTING
ADDRESS OF EACH SUB-TEST AS IT IS BEING ENTERED.
IF A SCOPE LOOP IS REQUESTED, IT WILL JUMP TO THE
START OF THE SUBTEST THAT THE SCOPE LOOP IS RE-
QUESTED FOR.

5.2.3 HALT

IS A ROUTINE THAT PRINTS-OUT AN ADDRESS THAT TAGS
THE FAILING SUBTEST, AND THE INCORRECT DATA AT
THE TIME OF THE FAILURE. SEE 6.1

(5. OPERATING PROCEDURE CONT'D)

5.3 PROGRAM AND/OR OPERATOR ACTION

5.3.1 LOADING AND STARTING AT 200 WITH ALL SWITCHES DOWN IS THE INSTRUCTION AND LOGIC TEST. IF AN ERROR IS DETECTED HERE, THERE WILL BE A PRINTOUT. WHEN AN ERROR IS DETECTED AND IT IS NECESSARY TO SCOPE ON IT, PLACE SW15 UP TO HALT ON ERROR, THEN SW14 UP TO LOOP ON ERROR, THEN SW13 UP TO DELETE PRINTOUTS.

6. ERRORS

6.1 ERROR PRINTOUT

ARE IN A FOUR WORD FORMAT. THE 1ST IS THE PC+2 OF THE DETECTED ERROR. THE 2ND IS THE PROCESSOR STATUS REGISTER. THE 3RD IS DEVICE ADDRESS, THE 4TH IS VECTOR ADDRESS.

6.2 ERROR RECOVERY

DEPRESS CONTINUE TO RESTART SECTION

7. RESTRICTIONS

7.1 STARTING RESTRICTION

NONE

7.2 OPERATIONAL RESTRICTION

THE DR11C MUST HAVE THE BC08R CABLE TO RUN THIS TEST.

NOTE THAT THE DR11C HAS FLOATING VECTORS:

THE BELOW IS THE ASSIGNMENT OF FLOATING VECTORS, THE ASSIGNED SEQUENCES ARE:

1. STARTING AT 300 AND WORKING UPWARD ALL DC11'S WILL BE ASSIGNED.
2. THEN ANY EXTRA KL11 CALLED FOR (VT05, VT06, LC11)
3. THEN ANY DP11 CALLED FOR.
4. THEN ANY DM11 CALLED FOR.
5. THEN ANY DN11 CALLED FOR.
6. THEN ANY DM11BB CALLED FOR.
7. THEN ANY DR11A CALLED FOR.
8. THEN ANY DR11C CALLED FOR.

THE DR11A AND DR11C DEVICE ADDRESSES WILL BE ASSIGNED IN THE USER AREA OF 767776 TO 764000. THE ASSIGNMENT OF ADDRESSES WILL START AT THE HIGH ADDRESS LIMIT AND PROCEED DOWNWARD. USERS AND SPECIAL SYSTEMS SHOULD START THEIR ASSIGNMENTS OF SPECIAL DEVICES AT THE LOW ADDRESS LIMIT AND WORK UP. AFTER ASSIGNING ALL DR11A'S, ASSIGN DR11C'S

```
767776 TO 767770        DR11C #0     ;ASSUMING NO DR11A'S
767766 TO 767760        DR11C #1
        .
        .
        .
767706 TO 767700        DR11C #7
        .
        .
        .
767606 TO 767600        DR11C #15
```

8. MISCELLANEOUS

WHERE THERE ARE MULTIPLE DR11C OR A SYSTEM AND IT IS DESIRED TO TEST ONLY ONE OF THEM. THIS MAY BE ACHIEVED BY USING THE SPECIAL STARTING ADDRESS AND PLACING SW10 ON A ONE (UP) TO INHIBIT SEQUENCING TO THE NEXT DR11C. SEE 4.3.1.

8.1 EXECUTION TIME

FOR EACH DR11C ABOUT 1 MINUTE

8.2 UNTESTED LOGIC

SIGNALS TO USER NOT TESTED:
"NEW DATA READY"
"DATA TRANSMITTED"
"INIT" TO THE USER

9. PROGRAM DESCRIPTION

THIS PROGRAM WHEN STARTED AT 200 CHECKS THE STANDARD DR11-C'S

THE PROGRAM THEN PERFORMES AN INCREMENTAL LOGIC CHECK FOR THE SELECTED DR11C.

THE DATA REGISTER IS TESTED TO SEE IF "RESET" CLEARS IT, AND IF IT WILL HOLD ALL COMBINATIONS OF NUMBERS.

THE READ/WRITE BITS OF THE STATUS REGISTER ARE ALSO TESTED.

BOTH THE "A" AND "B" INTERRUPTS ARE TESTED TO SEE IF THEY INTERRUPT AT THE CORRECT BUS REQUEST LEVEL BR-5.

AT THE END OF THE TEST AN '*' IS TYPED AND ALSO THE ADDRESSES OF THE DR11-C CONTROL STATUS REGISTER AND IT'S SIDE INTERRUPT VECTOR IS TYPED (IF SELECTED VIA SWITCH 9.). THE PROGRAM THEN RETESTS THE UNIT (IF SELECTED VIA SWITCH 10) OR SCANS TO THE NEXT DR11-C. IF ANOTHER DR11-C IS ON THE SYSTEM THEN THE PROGRAM RESTARTS TESTING

THE NEW DR11-C.

AFTER ALL DR11-C'S HAVE BEEN TESTED THE PROGRAM WILL
TYPE 'END PASS' AND RESTART TESTING WITH THE INITIAL DR11-C.

IF NO ERRORS OCCUR AND THREE DR11-C'S ARE AVAILABLE
AND SWITCH 9 IS DOWN THE PROGRAM WILL TYPE.

```
        160000 770 *
        157770 1000 *
        157760 1010 *
        /
        ETC.
```

IF SWITCH 9 IS UP THEN

```
        *
        *
        *
```

IF A POWER FAIL OCCURS THE PROGRAM WILL RESTART AT "START".

10. LISTING

%

```
                                ;GENERAL REGISTER LOGIC TEST

177776                          PSW=177776
104000                          HLT=104000
167770                          CSR=167770
                                ;REGISTER DEFINITIONS
000000                                  R0=%0
000001                                  R1=%1
000002                                  R2=%2
000003                                  R3=%3
000004                                  R4=%4
000005                                  R5=%5
000006                                  SP=%6
000007                                  PC=%7

                                ;SWITCHES
001000                                  SW9=1000
002000                                  SW10=2000
004000                                  SW11=4000
020000                                  SW13=20000
040000                                  SW14=40000


                                .SBTTL  BASIC DEFINITIONS

                                ;*INITIAL ADDRESS OF THE STACK POINTER *** 1200 ***
001200                          STACK=  1200
                                .EQUIV  EMT,ERROR       ;;BASIC DEFINITION OF ERROR CALL
                                .EQUIV  IOT,SCOPE       ;;BASIC DEFINITION OF SCOPE CALL

                                ;*MISCELLANEOUS DEFINITIONS
000011                          HT=     11              ;;CODE FOR HORIZONTAL TAB
000012                          LF=     12              ;;CODE FOR LINE FEED
000015                          CR=     15              ;;CODE FOR CARRIAGE RETURN
000200                          CRLF=   200             ;;CODE FOR CARRIAGE RETURN-LINE FEED
177776                          PS=     177776          ;;PROCESSOR STATUS WORD
                                .EQUIV  PS,PSW
177774                          STKLMT= 177774          ;;STACK LIMIT REGISTER
177772                          PIRQ=   177772          ;;PROGRAM INTERRUPT REQUEST REGISTER
177570                          DSWR=   177570          ;;HARDWARE SWITCH REGISTER
177570                          DDISP=  177570          ;;HARDWARE DISPLAY REGISTER

                                ;*GENERAL PURPOSE REGISTER DEFINITIONS
000000                          R0=     %0              ;;GENERAL REGISTER
000001                          R1=     %1              ;;GENERAL REGISTER
000002                          R2=     %2              ;;GENERAL REGISTER
000003                          R3=     %3              ;;GENERAL REGISTER
```

```
                        R4=     %4              ;;GENERAL REGISTER
                        R5=     %5              ;;GENERAL REGISTER
                        R6=     %6              ;;GENERAL REGISTER
                        R7=     %7              ;;GENERAL REGISTER
                        SP=     %6              ;;STACK POINTER
                        PC=     %7              ;;PROGRAM COUNTER

                        ;*PRIORITY LEVEL DEFINITIONS
                        PR0=    0               ;;PRIORITY LEVEL 0
                        PR1=    40              ;;PRIORITY LEVEL 1
                        PR2=    100             ;;PRIORITY LEVEL 2
                        PR3=    140             ;;PRIORITY LEVEL 3
                        PR4=    200             ;;PRIORITY LEVEL 4
                        PR5=    240             ;;PRIORITY LEVEL 5
                        PR6=    300             ;;PRIORITY LEVEL 6
                        PR7=    340             ;;PRIORITY LEVEL 7

                        ;*"SWITCH REGISTER" SWITCH DEFINITIONS
100000                  SW15=   100000
040000                  SW14=   40000
020000                  SW13=   20000
010000                  SW12=   10000
004000                  SW11=   4000
002000                  SW10=   2000
001000                  SW09=   1000
000400                  SW08=   400
000200                  SW07=   200
000100                  SW06=   100
000040                  SW05=   40
000020                  SW04=   20
000010                  SW03=   10
000004                  SW02=   4
000002                  SW01=   2
000001                  SW00=   1
                        .EQUIV  SW09,SW9
                        .EQUIV  SW08,SW8
                        .EQUIV  SW07,SW7
                        .EQUIV  SW06,SW6
                        .EQUIV  SW05,SW5
                        .EQUIV  SW04,SW4
                        .EQUIV  SW03,SW3
                        .EQUIV  SW02,SW2
                        .EQUIV  SW01,SW1
                        .EQUIV  SW00,SW0

                        ;*DATA BIT DEFINITIONS (BIT00 TO BIT15)
100000                  BIT15=  100000
040000                  BIT14=  40000
020000                  BIT13=  20000
010000                  BIT12=  10000
004000                  BIT11=  4000
002000                  BIT10=  2000
001000                  BIT09=  1000
000400                  BIT08=  400
000200                  BIT07=  200
000100                  BIT06=  100
```

```
                        000040          BIT05=  40
                        000020          BIT04=  20
                        000010          BIT03=  10
                        000004          BIT02=  4
                        000002          BIT01=  2
                        000001          BIT00=  1
                                        .EQUIV  BIT09,BIT9
                                        .EQUIV  BIT08,BIT8
                                        .EQUIV  BIT07,BIT7
                                        .EQUIV  BIT06,BIT6
                                        .EQUIV  BIT05,BIT5
                                        .EQUIV  BIT04,BIT4
                                        .EQUIV  BIT03,BIT3
                                        .EQUIV  BIT02,BIT2
                                        .EQUIV  BIT01,BIT1
                                        .EQUIV  BIT00,BIT0

                                        ;*BASIC "CPU" TRAP VECTOR ADDRESSES
                        000004          ERRVEC= 4               ;;TIME OUT AND OTHER ERRORS
                        000010          RESVEC= 10              ;;RESERVED AND ILLEGAL INSTRUCTIONS
                        000014          TBITVEC=14              ;;"T" BIT
                        000014          TRTVEC= 14              ;;TRACE TRAP
                        000014          BPTVEC= 14              ;;BREAKPOINT TRAP (BPT)
                        000020          IOTVEC= 20              ;;INPUT/OUTPUT TRAP (IOT) **SCOPE**
                        000024          PWRVEC= 24              ;;POWER FAIL
                        000030          EMTVEC= 30              ;;EMULATOR TRAP (EMT) **ERROR**
                        000034          TRAPVEC=34              ;;"TRAP" TRAP
                        000060          TKVEC=  60              ;;TTY KEYBOARD VECTOR
                        000064          TPVEC=  64              ;;TTY PRINTER VECTOR
                        000240          PIRQVEC=240             ;;PROGRAM INTERRUPT REQUEST VECTOR
                                                .ENABLE ABS
                        000000                  .=0
000000  000002                                  .+2
000002  000000                                  HALT
000004  000006                                  .+2
000006  000000                                  HALT
000010  000012                                  .+2
000012  000000                                  HALT
000014  000016                                  .+2
000016  000000                                  HALT
000020  000022                                  .+2
000022  000000                                  HALT
000024  000026                                  .+2
000026  000000                                  HALT
000030  000032                                  .+2
000032  000000                                  HALT
000034  000036                                  .+2
000036  000000                                  HALT
000040  000042                                  .+2
000042  000000                                  HALT
000044  000046                                  .+2
000046  000000                                  HALT
000050  000052                                  .+2
000052  000000                                  HALT
000054  000056                                  .+2
000056  000000                                  HALT
```

```
   457  000060  000062                    .+2
   458  000062  000000                    HALT
   459  000064  000066                    .+2
   460  000066  000000                    HALT
   461  000070  000072                    .+2
   462  000072  000000                    HALT
   463  000074  000076                    .+2
   464  000076  000000                    HALT
   465  000100  000102                    .+2
   466  000102  000000                    HALT
   467  000104  000106                    .+2
   468  000106  000000                    HALT
   469  000110  000112                    .+2
   470  00011.  000000                    HALT
   471  000114  000116                    .+2
   472  000116  000000                    HALT
   473  000120  000122                    .+2
   474  000122  000000                    HALT
   475  000124  000126                    .+2
   476  000126  000000                    HALT
   477  000130  000132                    .+2
   478  000132  000000                    HALT
   479  000134  000136                    .+2
   480  000136  000000                    HALT
   481  000140  000142                    .+2
   482  000142  000000                    HALT
   483  000144  000146                    .+2
   484  000146  000000                    HALT
   485  000150  000152                    .+2
   486  000152  000000                    HALT
   487  000154  000156                    .+2
   488  000156  000000                    HALT
   489  000160  000162                    .+2
   490  000162  000000                    HALT
   491  000164  000166                    .+2
   492  000166  000000                    HALT
   493  000170  000172                    .+2
   494  000172  000000                    HALT
   495  000174  000176                    .+2
   496  000176  000000                    HALT
   497  000200  000202                    .+2
   498  000202  000000                    HALT
   499  000204  000206                    .+2
   500  000206  000000                    HALT
   501  000210  000212                    .+2
   502  000212  000000                    HALT
   503  000214  000216                    .+2
   504  000216  000000                    HALT
   505  000220  000222                    .+2
   506  000222  000000                    HALT
   507  000224  000226                    .+2
   508  000226  000000                    HALT
   509  000230  000232                    .+2
   510  000232  000000                    HALT
   511  000234  000236                    .+2
   512  000236  000000                    HALT
```

```
  513  000240  000242                    .+2
  514  000242  000000                    HALT
  515  000244  000246                    .+2
  516  000246  000000                    HALT
  517  000250  000252                    .+2
  518  000252  000000                    HALT
  519  000254  000256                    .+2
  520  000256  000000                    HALT
  521  000260  000262                    .+2
  522  000262  000000                    HALT
  523  000264  000266                    .+2
  524  000266  000000                    HALT
  525  000270  000272                    .+2
  526  000272  000000                    HALT
  527  000274  000276                    .+2
  528  000276  000000                    HALT
  529  000300  000302                    .+2
  530  000302  000000                    HALT
  531  000304  000306                    .+2
  532  000306  000000                    HALT
  533  000310  000312                    .+2
  534  000312  000000                    HALT
  535  000314  000316                    .+2
  536  000316  000000                    HALT
  537  000320  000322                    .+2
  538  000322  000000                    HALT
  539  000324  000326                    .+2
  540  000326  000000                    HALT
  541  000330  000332                    .+2
  542  000332  000000                    HALT
  543  000334  000336                    .+2
  544  000336  000000                    HALT
  545  000340  000342                    .+2
  546  000342  000000                    HALT
  547  000344  000346                    .+2
  548  000346  000000                    HALT
  549  000350  000352                    .+2
  550  000352  000000                    HALT
  551  000354  000356                    .+2
  552  000356  000000                    HALT
  553  000360  000362                    .+2
  554  000362  000000                    HALT
  555  000364  000366                    .+2
  556  000366  000000                    HALT
  557  000370  000372                    .+2
  558  000372  000000                    HALT
  559  000374  000376                    .+2
  560  000376  000000                    HALT
  561  000400  000402                    .+2
  562  000402  000000                    HALT
  563  000404  000406                    .+2
  564  000406  000000                    HALT
  565  000410  000412                    .+2
  566  000412  000000                    HALT
  567  000414  000416                    .+2
  568  000416  000000                    HALT
```

```
569  000420  000422                .+2
570  000422  000000                HALT
571  000424  000426                .+2
572  000426  000000                HALT
573  000430  000432                .+2
574  000432  000000                HALT
575  000434  000436                .+2
576  000436  000000                HALT
577  000440  000442                .+2
578  000442  000000                HALT
579  000444  000446                .+2
580  000446  000000                HALT
581  000450  000452                .+2
582  000452  000000                HALT
583  000454  000456                .+2
584  000456  000000                HALT
585  000460  000462                .+2
586  000462  000000                HALT
587  000464  000466                .+2
588  000466  000000                HALT
589  000470  000472                .+2
590  000472  000000                HALT
591  000474  000476                .+2
592  000476  000000                HALT
593  000500  000502                .+2
594  000502  000000                HALT
595  000504  000506                .+2
596  000506  000000                HALT
597  000510  000512                .+2
598  000512  000000                HALT
599  000514  000516                .+2
600  000516  000000                HALT
601  000520  000522                .+2
602  000522  000000                HALT
603  000524  000526                .+2
604  000526  000000                HALT
605  000530  000532                .+2
606  000532  000000                HALT
607  000534  000536                .+2
608  000536  000000                HALT
609  000540  000542                .+2
610  000542  000000                HALT
611  000544  000546                .+2
612  000546  000000                HALT
613  000550  000552                .+2
614  000552  000000                HALT
615  000554  000556                .+2
616  000556  000000                HALT
617  000560  000562                .+2
618  000562  000000                HALT
619  000564  000566                .+2
620  000566  000000                HALT
621  000570  000572                .+2
622  000572  000000                HALT
623  000574  000576                .+2
624  000576  000000                HALT
```

```
625  000600  000602                  .+2
626  000602  000000                  HALT
627  000604  000606                  .+2
628  000606  000000                  HALT
629  000610  000612                  .+2
630  000612  000000                  HALT
631  000614  000616                  .+2
632  000616  000000                  HALT
633  000620  000622                  .+2
634  000622  000000                  HALT
635  000624  000626                  .+2
636  000626  000000                  HALT
637  000630  000632                  .+2
638  000632  000000                  HALT
639  000634  000636                  .+2
640  000636  000000                  HALT
641  000640  000642                  .+2
642  000642  000000                  HALT
643  000644  000646                  .+2
644  000646  000000                  HALT
645  000650  000652                  .+2
646  000652  000000                  HALT
647  000654  000656                  .+2
648  000656  000000                  HALT
649  000660  000662                  .+2
650  000662  000000                  HALT
651  000664  000666                  .+2
652  000666  000000                  HALT
653  000670  000672                  .+2
654  000672  000000                  HALT
655  000674  000676                  .+2
656  000676  000000                  HALT
657  000700  000702                  .+2
658  000702  000000                  HALT
659  000704  000706                  .+2
660  000706  000000                  HALT
661  000710  000712                  .+2
662  000712  000000                  HALT
663  000714  000716                  .+2
664  000716  000000                  HALT
665  000720  000722                  .+2
666  000722  000000                  HALT
667  000724  000726                  .+2
668  000726  000000                  HALT
669  000730  000732                  .+2
670  000732  000000                  HALT
671  000734  000736                  .+2
672  000736  000000                  HALT
673  000740  000742                  .+2
674  000742  000000                  HALT
675  000744  000746                  .+2
676  000746  000000                  HALT
677  000750  000752                  .+2
678  000752  000000                  HALT
679  000754  000756                  .+2
680  000756  000000                  HALT
```

```
000760  000762                  .+2
000762  000000                  HALT
000764  000766                  .+2
000766  000000                  HALT
000770  000772                  .+2
000772  000000                  HALT
000774  000776                  .+2
000776  000000                  HALT
        000020                  .=20
000020  004652                  .SCOPE
000022  000340                  340
000024  005124                  PFAIL
000026  000340                  340
000030  004126                  .HLT
000032  000340                  340
000034  005316                  TYP
000036  000340                  340
        000046                  .=46
000046  004112                  $ENDAD
        000052                  .=52
000052  000000                  0
        000174                  .=174
000174  000000          DISPRE: 0
000176  000000          SWREG:  0
        000200                  .=200
000200  000137  001250          JMP     @#START1        ;INITIAL START
000204  000137  001616          JMP     @#SPEC          ;TO SELECT UNIQUE ADDRESS AND VECTOR
000210  000137  001726          JMP     @#START         ;RESTART
        001200                  .=1200

                        ;THIS TABLE CONTAINS INITIAL REGISTER AND VECTOR ADDRESSES

001200  167770          RCSR:   CSR
001202  167772                  CSR+2
001204  167774                  CSR+4
001206  167773                  CSR+3
001210  000300          RCSR1:  300
001212  000302                  302
001214  000304                  304

                        ;THIS TABLE CONTAINS REGISTER AND VECTOR ADDRESSES OF THE DR11-C UNDER TEST

001216  177570          SWR:    177570
001220  177570          DISPLA: 177570
001222  167770          DRCSR:  167770          ;ADDRESS OF DR11-C STATUS REGISTER
001224  167772          DROBUF: 167772          ;ADDRESS OF DR OUTPUT BUFFER REG.
001226  167774          DRIBUF: 167774          ;ADDRESS OF DR INPUT BUFFER REG.
001230  167773          DRBHIO: 167773          ;HIGH BYTE OF OUTPUT BUFFER REG.

001232  000300          DRVECA: 300             ,INTERRUPT VECTOR OF UNIT UNDER TEST
001234  000302          DRLVL:  302
001236  000304          DRVECB: 304             ;INTERRUPT VECTOR
001240  000000          XORFLG: 0

001242  000000          COUNT:  0               ;COUNT LOCATION
001244  000240          PL:     240             ;PRIORITY LEVEL
```

```
                                        PASCNT: 0                       ;NUMBER OF PASSES COMPLETED

001250                                  START1:
                                        .SBTTL  INITIALIZE THE COMMON TAGS
001250  012706  001200                          MOV     #STACK,SP       ;;SETUP THE STACK POINTER
                                        ;;SIZE FOR A HARDWARE SWITCH REGISTER. IF NOT FOUND OR IT IS
                                        ;;EQUAL TO A "-1", SETUP FOR A SOFTWARE SWITCH REGISTER.
001254  013746  000004                          MOV     @#ERRVEC,-(SP)  ;;SAVE ERROR VECTOR
001260  012737  001314  000004                  MOV     #64$,@#ERRVEC   ;;SET UP ERROR VECTOR
001266  012767  177570  177722                  MOV     #0SWR,SWR       ;;SETUP FOR A HARDWARE SWICH REGISTER
001274  012767  177570  177716                  MOV     #0DISP,DISPLAY  ;;AND A HARDWARE DISPLAY REGISTER
001302  022777  177777  177706                  CMP     #-1,@SWR        ;;TRY TO REFERENCE HARDWARE SWR
001310  001012                                  BNE     66$             ;;BRANCH IF NO TIMEOUT TRAP OCCURRED
                                                                        ;;AND  THE HARDWARE SWR IS NOT = -1
001312  000403                                  BR      65$             ;;BRANCH IF NO TIMEOUT
001314  012716  001322                  64$:    MOV     #65$,(SP)       ;;SET UP FOR TRAP RETURN
001320  000002                                  RTI
001322  012767  000176  177666          65$:    MOV     #SWREG,SWR      ;;POINT TO SOFTWARE SWR
001330  012767  000174  177662                  MOV     #DISPREG,DISPLAY
001336  012637  000004                  66$:    MOV     (SP)+,@#ERRVEC  ;;RESTORE ERROR VECTOR

001342  023737  000042  000046                  CMP     @#42,@#46
001350  001433                                  BEQ     3$              ;YES, SKIP TITLE
                                        .SBTTL  TYPE PROGRAM NAME
                                        ;;TYPE THE NAME OF THE PROGRAM IF FIRST PASS
001352  005227  177777                          INC     #-1             ;;FIRST TIME?
001356  001027                                  BNE     67$             ;;BRANCH IF NO
001360  104401  001416                          TYPE    ,68$            ;;TYPE ASCIZ STRING
                                        .SBTTL  GET VALUE FOR SOFTWARE SWITCH REGISTER
001364  005737  000042                          TST     @#42            ;;ARE WE RUNNING UNDER XXDP/ACT?
001370  001006                                  BNE     69$             ;;BRANCH IF YES
001372  026727  177620  000176                  CMP     SWR,#SWREG      ;;SOFTWARE SWITCH REG SELECTED?
001400  001005                                  BNE     70$             ;;BRANCH IF NO
001402  104405                                  GTSWR                   ;;GET SOFT-SWR SETTINGS
001404  000403                                  BR      70$
001406  112767  000001  005144          69$:    MOVB    #1,$AUTOB       ;;SET AUTO-MODE INDICATOR
001414                                  70$:
001414  000410                                  BR      67$             ;;GET OVER THE ASCIZ
                                        ;;68$:  .ASCIZ  <CRLF>#MD-11-DZDRC-G#<CRLF>
001436                                  67$:
001436  000463                                  BR      8$                      ;SKIP INTERRUPT VECTOR SIZER IF
                                                                                ;IN AUTOMATIC MODE
                                        ;SIZE FOR INTERRUPT VECTOR IF IN AUTOMATIC MODE.

001440  012700  000302          3$:     MOV     #302,R0                 ;SET UP FLOATING VECTOR AREA
001444  010060  177776          4$:     MOV     R0,-2(R0)
001450  012720  000003                  MOV     #3,(R0)+
001454  005720                          TST     (R0)+
001456  022700  000776                  CMP     #776,R0
001462  100370                          BPL     4$
001464  012737  001516  000014                  MOV     #5$,@#14                        ;SET UP BPT
001472  012737  000340  000016                  MOV     #340,@#16               ;SET UP BPT PSW
001500  012777  000101  177472                  MOV     #101,@RCSR              ;FORCE AN INTERRUPT
001506  000240                          NOP
001510  000240                          NOP
001512  000000                          HALT                            ;NO INTERRUPT OCCURRED
```

```
001514  000423                          BR      6$
001516  162716  000004          5$:     SUB     #4,(SP)                 ;FIGURE OUT INTERRUPT VECTOR
001522  011637  001210                  MOV     (SP),@#RCSR1            ;PUT IT IN TABLE
001526  013737  001210  001212          MOV     @#RCSR1,@#RCSR1+2
001534  062737  000002  001212          ADD     #2,@#RCSR1+2            ;FILL IN NEXT TABLE ENTRY
001542  013737  001210  001214          MOV     @#RCSR1,@#RCSR1+4
001550  062737  000004  001214          ADD     #4,@#RCSR1+4            ;FILL IN LAST TABLE ENTRY
001556  012737  000016  000014          MOV     #16,@#14                ;RESTORE BPT
001564  012700  000302          6$:     MOV     #302,R0                 ;SET UP TRAP CATCHER
001570  010060  177776          7$:     MOV     R0,-2(R0)
001574  005020                          CLR     (R0)+
001576  005720                          TST     (R0)+
001600  022700  000776                  CMP     #776,R0
001604  100371                          BPL     7$
001606  004767  000020          8$:     JSR     PC,FIRST
001612  000137  001726                  JMP     @#START
001616  012706  001200          SPEC:   MOV     #STACK,%6
001622  004767  000004                  JSR     PC,FIRST
001626  000167  003360                  JMP     SPEC0
001632  013746  000004          FIRST:  MOV     @#4,-(%6)
001636  012737  001712  000004          MOV     #XORA,@#4
001644  012737  000031  177060          MOV     #31,@#177060
001652  012637  000004                  MOV     (%6)+,@#4
001656  012737  177777  001240          MOV     #-1,@#XORFLG
001664  012701  160000                  MOV     #160000,R1
001670  004737  005246                  JSR     PC,@#SPEC1
001674  012701  000770                  MOV     #770,R1
001700  004737  005276                  JSR     PC,@#SPEC2
001704  104401                          TYPE
001706  006640                          MESS1
001710  000207                          RTS     PC
001712  022626          XORA:   CMP     (%6)+,(%6)+
001714  012637  000004                  MOV     (%6)+,@#4
001720  005037  001240                  CLR     @#XORFLG
001724  000207                          RTS     PC
                        ;INITIALIZE ADDRESS AND VECTORS
001726  012700  001200          START:  MOV     #RCSR,R0                ;GET ADDRESS OF FIRST POSSIBLE DR11-C'S
001732  012701  001222                  MOV     #DRCSR,R1
001736  012021                          MOV     (R0)+,(R1)+             ;LOAD INITIAL TEST ADDRESSES
001740  012021                          MOV     (R0)+,(R1)+
001742  012021                          MOV     (R0)+,(R1)+
001744  012021                          MOV     (R0)+,(R1)+
001746  012021                          MOV     (R0)+,(R1)+
001750  012021                          MOV     (R0)+,(R1)+
001752  012021                          MOV     (R0)+,(R1)+
001754  012706  001200          RSTART: MOV     #STACK,%6               ;SET UP STACK
001760  012767  002010  003004          MOV     #BEGIN,RETURN           ;SET SCOPE RETURN
001766  005037  004770                  CLR     @#SCOPEF

                        ;DOES RESET CLEAR REGISTER?
001772  104406                          CKSWR
001774  032777  001000  177214          BIT     #SW9,@SWR
002002  001002                          BNE     BEGIN
002004  004737  005010                  JSR     PC,@#MOREID
002010  016705  177206          BEGIN:  MOV     DRCSR,R5                ;GET ADDRESS OF STATUS REGISTER
002014  012777  000240  175754          MOV     #240,@PSW               ;SET PRIORITY LEVEL 6
```

```
002022  012737  002060  000004          MOV     #1$,@#4         ;SET TIME OUT TRAP VECTOR
002030  012767  000010  002730          MOV     #10,ICOUNT
002036  012777  177777  177160          MOV     #-1,@DROBUF     ;PRESET OUTPUT BUFFER
002044  000005                          RESET                   ;CLEAR DATA REGISTER
002046  017700  177152                  MOV     @DROBUF,%0      ;GET RESULT OF RESET
002052  001403                          BEQ     2$
002054  104000                          HLT                     ;DATA REGISTER NOT CLEAR
002056  000401                          BR      2$
002060  104000                  1$:     HLT                     ;ERROR! TIMED OUT WHEN REFERENCING DROBUF.
002062  012706  001200          2$:     MOV     #STACK,SP       ;RESET STACK POINTER
002066  012737  000006  000004          MOV     #6,@#4          ;RESTORE TIME OUT TRAP

002074  000004                          SCOPE
002076  012767  004000  002662          MOV     #4000,ICOUNT
002104  012777  177777  177112          MOV     #-1,@DROBUF     ;ALL ONES TO REGISTER
002112  017700  177106                  MOV     @DROBUF,%0
002116  022700  177777                  CMP     #-1,%0
002122  001401                          BEQ     .+4
002124  104000                          HLT                     ;REG WILL NOT HOLD ONES

002126  000004                          SCOPE
002130  012767  000010  002630          MOV     #10,ICOUNT
002136  012777  177777  177060          MOV     #-1,@DROBUF
002144  000005                          RESET                   ;SET DATA TO ALL ONES
002146  005777  177054                  TST     @DROBUF         ;SHOULD CLEAR REGISTER
002152  001401                          BEQ     .+4
002154  104000                          HLT                     ;REG FAILED TO CLEAR

002156  000004                          SCOPE
002160  012767  004000  002600          MOV     #4000,ICOUNT
002166  012777  052525  177030          MOV     #52525,@DROBUF
002174  017700  177024                  MOV     @DROBUF,%0
002200  022700  052525                  CMP     #52525,%0
002204  001401                          BEQ     .+4
002206  104000                          HLT                     ;DATA NOT=52525

002210  000004                          SCOPE
002212  012777  125252  177004          MOV     #125252,@DROBUF
002220  017700  177000                  MOV     @DROBUF,%0
002224  022700  125252                  CMP     #125252,%0
002230  001401                          BEQ     .+4
002232  104000                          HLT                     ;DATA NOT=125252

                        ;TEST RELIABILITY OF DR11-C OUTPUT BUFFER REGISTER
002234  000004                          SCOPE
002236  012737  000040  004766          MOV     #40,@#ICOUNT
002244  010502                  BUFTST: MOV     R5,R2           ;GET ADDRESS OF DRCSR
002246  005722                          TST     (R2)+           ;R2=ADDRESS OF OUTPUT BUFFER REG.
002250  012703  000401                  MOV     #401,R3         ;LOAD CONSTANT
002254  012704  000400          1$:     MOV     #256.,R4        ;SET COUNT
002260  005000                          CLR     R0              ;PRESET EXPECTED RESULT
002262  005012                          CLR     (R2)            ;CLEAR REGISTER
002264  060300                  2$:     ADD     R3,R0
002266  060312                          ADD     R3,(R2)
002270  021200                          CMP     (R2),R0
002272  001401                          BEQ     .+4
```

```
                                                HLT
                                                DEC     R4
                                                BNE     2$
                                                ASL     R3
                                                BNE     1$

                                ;TEST THAT BYTE REFERENCE TO DROBUF AFFECT PROPER BYTE ONLY

002306  000004                                SCOPE
002310  012777  177777  176706  TAG:  MOV     #-1,@DROBUF
002316  105077  176702                CLRB    @DROBUF         ;CLEAR LOW BYTE
002322  017700  176676                MOV     @DROBUF,%0
002326  022700  177400                CMP     #177400,%0
002332  001401                        BEQ     .+4
002334  104000                        HLT                     ;BYTE LOW FAILED TO CLEAR

002336  000004                        SCOPE
002340  012777  177777  176656        MOV     #-1,@DROBUF
002346  105077  176656                CLRB    @DRBHIO         ;CLEAR HIGH BYTE
002352  017700  176646                MOV     @DROBUF,%0
002356  022700  000377                CMP     #377,%0
002362  001401                        BEQ     .+4
002364  104000                        HLT                     ;HIGH BYTE CLEAR FAILED

002366  000004                        SCOPE
002370  005037  002440                CLR     @#2$
002374  012704  002440                MOV     #2$,R4
002400  005077  176620                CLR     @DROBUF
002404  105077  176620                CLRB    @DRBHIO
002410  105277  176614        1$:     INCB    @DRBHIO         ;INCREMENT HIGH BYTE
002414  105264  000001                INCB    1(R4)
002420  027714  176600                CMP     @DROBUF,(F
002424  001401                        BEQ     .+4
002426  104000                        HLT                     ;HIGH BYTE HAS BAD DATA
002430  105764  000001                TSTB    1(R4)
002434  001402                        BEQ     3$
002436  000764                        BR      1$
002440  000000        2$:             .WORD   0
002442  000004        3$:             SCOPE
                                ;CONTROL STATUS REGISTER (DRCSR) TESTS.
002444  005015                        CLR     (R5)
002446  011500                        MOV     (R5),R0
002450  001401                        BEQ     .+4
002452  104000                        HLT
002454  012715  000140                MOV     #140,@R5        ;INTERRUPT ENABLE FOR A+B
002460  011500                        MOV     @R5,%0
002462  022700  000140                CMP     #140,%0         ;ENABLE BITS
002466  001401                        BEQ     .+4
002470  104000                        HLT

002472  000004                        SCOPE
002474  012767  000010  002264        MOV     #10,ICOUNT
002502  012715  000140                MOV     #140,@R5        ;SET INTERRUPT ENABLE FLOPS
002506  000005                        RESET                   ;CLEAR THOSE FLOPS
002510  011500                        MOV     @R5,%0
002512  001401                        BEQ     .+4
```

```
 961  002514  104000                          HLT                     ;RESET DID NOT CLEAR INTERRUPT ENABLE BITS
 962
 963  002516  000004                          SCOPE
 964  002520  052715  000001                  BIS     #1,@R5          ;SHOULD SET REQ A ALSO
 965  002524  021527  000201                  CMP     @R5,#201
 966  002530  001401                          BEQ     .+4
 967  002532  104000                          HLT
 968  002534  005015                          CLR     @R5
 969
 970  002536  000004                          SCOPE
 971  002540  052715  000002                  BIS     #2,@R5          ;SHOULD SET REQ B
 972  002544  021527  100002                  CMP     @R5,#100002
 973  002550  001401                          BEQ     .+4
 974  002552  104000                          HLT
 975  002554  005015                          CLR     @R5
 976
 977  002556  000004                          SCOPE
 978  002560  052737  000340  177776          BIS     #340,@#PSW
 979  002566  052715  177777                  BIS     #-1,@R5
 980  002572  022715  100343                  CMP     #100343,(R5)
 981  002576  001401                          BEQ     .+4
 982  002600  104000                          HLT
 983  002602  042715  000003                  BIC     #3,@R5
 984  002606  022715  000140                  CMP     #140,@R5
 985  002612  001401                          BEQ     .+4
 986  002614  104000                          HLT                     ;WRONG BITS SET
 987
 988  002616  000004                          SCOPE
 989  002620  012737  000340  177776          MOV     #340,@#PSW
 990  002626  052715  000003                  BIS     #3,@R5
 991  002632  000005                          RESET
 992  002634  005715                          TST     @R5
 993  002636  001401                          BEQ     .+4
 994  002640  104000                          HLT                     ;RESET DID NOT CLEAR
 995
 996  002642  000004                          SCOPE
 997  002644  012767  004000  002114          MOV     #4000,ICOUNT
 998  002652  005015                          CLR     @R5
 999  002654  005215                          INC     @R5
1000  002656  105715                          TSTB    @R5
1001  002660  100401                          BMI     .+4
1002  002662  104000                          HLT                     ;BIT 0 DID NOT SET BIT 7
1003
1004  002664  000004                          SCOPE
1005  002666  012715  000002                  MOV     #2,@R5
1006  002672  005715                          TST     @R5
1007  002674  100401                          BMI     .+4
1008  002676  104000                          HLT                     ;BIT 1 DID NOT SET BIT 15
1009
1010                          ;TEST EXTERNAL TRANSFERS - CABLE MUST BE CONNECTED
1011  002700  000004                          SCOPE
1012  002702  005077  176316                  CLR     @DROBUF
1013  002706  017777  176314  176310          MOV     @DRIBUF,@DROBUF ;TEST TRANSFER OF ZERO
1014  002714  001401                          BEQ     .+4
1015  002716  104000                          HLT                     ;NOT EQUAL TO ZERO
1016
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1017  002720  000004                        SCOPE
1018  002722  012777  177777  176274        MOV     #-1,@DROBUF
1019  002730  017777  176272  176266        MOV     @DRIBUF,@DROBUF ;MOV ALL ONES
1020  002736  022777  177777  176260        CMP     #-1,@DROBUF
1021  002744  001401                        BEQ     .+4
1022  002746  104000                        HLT                     ;NOT ALL ONES
1023
1024  002750  000004                        SCOPE
1025  002752  005067  002010                CLR     ICOUNT
1026  002756  005000                        CLR     %0
1027  002760  010077  176240        TST6:   MOV     %0,@DROBUF      ;TEST ALL NUMBERS
1028  002764  017777  176236  176232        MOV     @DRIBUF,@DROBUF
1029  002772  020077  176226                CMP     %0,@DROBUF
1030  002776  001401                        BEQ     .+4
1031  003000  104000                        HLT                     ;ERROR - CHECK %0 FOR GOOD
1032  003002  005200                        INC     %0              ;DROBUF FOR BAD
1033  003004  001403                        BEQ     TST9
1034  003006  005077  176212                CLR     @DROBUF
1035  003012  000762                        BR      TST6
1036  003014  000004                TST9:   SCOPE
1037  003016  012737  000005  004766        MOV     #5,@#ICOUNT
1038                                ;TEST DATA FROM BLACK BOX (NOT CONNECTED)
1039  003024  012777  177777  176172        MOV     #-1,@DROBUF
1040  003032  017777  176166  176166        MOV     @DROBUF,@DRIBUF ;STATIC LINES EQUAL ONES
1041  003040  017700  176162                MOV     @DRIBUF,%0      ;DATA REGISTER TO %0
1042  003044  022700  177777                CMP     #-1,%0
1043  003050  001401                        BEQ     .+4
1044  003052  104000                        HLT                     ;REG 0 SHOULD = ALL ONES
1045
1046                                ;READY BIT IS IN A ONE STATE
1047  003054  000004                        SCOPE
1048  003056  012715  000003                MOV     #3,@R5          ;CSR0 AND CSR1
1049  003062  011500                        MOV     (R5),R0
1050  003064  022700  100203                CMP     #100203,R0
1051  003070  001401                        BEQ     .+4
1052  003072  104000                        HLT
1053
1054                                ;CAN WE RAISE INTERUPT "A"
1055  003074  000004                        SCOPE
1056  003076  052737  000340  177776        BIS     #340,@#PSW      ;LOCK OUT INTERRUPTS
1057  003104  012706  001200                MOV     #STACK,%6
1058  003110  012777  003132  176114        MOV     #TST4,@DRVECA   ;INTERRUPT RETURN POINTER
1059  003116  012715  000101                MOV     #101,@R5        ;INTERRUPT ENABLE AND CSR0
1060  003122  005037  177776                CLR     @#PSW
1061  003126  000240                        NOP
1062  003130  104000                        HLT                     ;NO "A" INTERRUPT
1063  003132  005015                TST4:   CLR     @R5
1064  003134  016777  176074  176070        MOV     DRLVL,@DRVECA   ;MOVE .+2 TO "A" INTERRUPT VECTOR
1065
1066                                ;RAISE INTERRUPT "B"
1067  003142  000004                        SCOPE
1068  003144  012706  001200                MOV     #STACK,%6
1069  003150  052737  000340  177776        BIS     #340,@#PSW
1070  003156  012777  003202  176052        MOV     #TST5,@DRVECB
1071  003164  012715  000042                MOV     #42,@R5         ;IE AND CSR1
1072  003170  042737  000377  177776        BIC     #377,@#PSW
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1073  003176  000240                        NOP
1074  003200  104000                        HLT                         ;NO B INTERRUPT
1075  003202  005015                TST5:   CLR     @R5
1076
1077                                        ;TEST FOR INTERRUPT FROM DEVICE
1078  003204  016777  176034  176022        MOV     PL,@DRLVL
1079  003212  042737  000340  177776        BIC     #340,@#PSW          ;PROCESSOR LEVEL ZERO
1080  003220  012777  003252  176004        MOV     #TINT1,@DRVECA
1081  003226  012706  001200                MOV     #STACK,%6           ;STACK POINTER
1082  003232  042777  000100  175762        BIC     #100,@DRCSR         ;CLEAR INTERRUPT ENABLE
1083  003240  052777  000101  175754        BIS     #101,@DRCSR         ;SET INTERRUPT ENABLE-AND CSR0
1084  003246  000240                        NOP
1085  003250  104000                        HLT                         ;NO DEVICE INTERRUPT OCCURED
1086  003252  000004                TINT1:  SCOPE
1087
1088                                        ;TEST FOR INTERRUPT FROM THE DEVICE
1089  003254  042737  000340  177776        BIC     #340,@#PSW
1090  003262  052737  000040  177776        BIS     #040,@#PSW          ;SET TO PRIORITY LEVEL 1
1091  003270  012777  003322  175734        MOV     #TINT2,@DRVECA      ;INTERRUPT VECTOR ADDRESS
1092  003276  012706  001200                MOV     #STACK,%6           ;SET UP STACK POINTER
1093  003302  042777  000100  175712        BIC     #100,@DRCSR         ;CLEAR INTERRUPT ENABLE
1094  003310  052777  000101  175704        BIS     #101,@DRCSR         ;SET INTERRUPT ENABLE-AND CSR0
1095  003316  000240                        NOP
1096  003320  104000                        HLT                         ;NO DEVICE INTERRUPT OCCURED
1097
1098  003322  000004                TINT2:  SCOPE
1099  003324  042737  000340  177776        BIC     #340,@#PSW
1100  003332  052737  000100  177776        BIS     #100,@#PSW          ;SET TO PRIORITY LEVEL 2
1101  003340  012777  003372  175664        MOV     #TINT3,@DRVECA      ;INTERRUPT VECTOR ADDRESS
1102  003346  012706  001200                MOV     #STACK,%6           ;SET UP STACK POINTER
1103  003352  042777  000100  175642        BIC     #100,@DRCSR         ;CLEAR INTERRUPT ENABLE
1104  003360  052777  000101  175634        BIS     #101,@DRCSR         ;SET INTERRUPT ENABLE-AND CSR0
1105  003366  000240                        NOP
1106  003370  104000                        HLT                         ;NO DEVICE INTERRUPT OCCURED
1107
1108  003372  000004                TINT3:  SCOPE
1109                                        ;TEST FOR INTERRUPT FROM THE DEVICE
1110  003374  042737  000340  177776        BIC     #340,@#PSW
1111  003402  052737  000140  177776        BIS     #140,@#PSW          ;SET TO PRIORITY LEVEL 3
1112  003410  012777  003442  175614        MOV     #TINT4,@DRVECA      ;INTERRUPT VECTOR ADDRESS
1113  003416  012706  001200                MOV     #STACK,%6           ;SET UP STACK POINTER
1114  003422  042777  000100  175572        BIC     #100,@DRCSR         ;CLEAR INTERRUPT ENABLE
1115  003430  052777  000101  175564        BIS     #101,@DRCSR         ;SET INTERRUPT ENABLE-AND CSR0
1116  003436  000240                        NOP
1117  003440  104000                        HLT                         ;NO DEVICE INTERRUPT OCCURED
1118  003442  000004                TINT4:  SCOPE
1119
1120                                        ;TEST FOR INTERRUPT FROM DEVICE
1121  003444  042737  000340  177776        BIC     #340,@#PSW
1122  003452  052737  000200  177776        BIS     #200,@#PSW          ;RAISE PROCESSOR PRIORITY TO LEVEL 4
1123  003460  012777  003522  175544        MOV     #TINT5,@DRVECA      ;IN CASE OF INTERRUPT
1124  003466  012706  001200                MOV     #STACK,%6           ;SET STACK POINTER
1125  003472  042777  000100  175522        BIC     #100,@DRCSR         ;CLEAR INTERRUPT ENABLE
1126  003500  052777  000101  175514        BIS     #101,@DRCSR         ;SET INTERRUPT ENABLE AND CSR0
1127  003506  000240                        NOP                         ;LET INTERRUPT OCCUR
1128  003510  042777  000100  175504        BIC     #100,@DRCSR
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1129  003516  000240                          NOP
1130  003520  104000                          HLT                         ;NO DEVICE INTERRUPT OCCURED
1131  003522  000004              TINT5:      SCOPE
1132
1133                              ;TEST FOR NO INTERRUPT FROM DEVICE (HIGHEST PROCESSOR PRIORITY)
1134  003524  052737  000340  177776          BIS     #340,@#PSW          ;RAISE PROCESSOR PRIORITY TO HIGHEST LEVEL
1135  003532  012777  003572  175472          MOV     #TINT6,@DRVECA      ;IN CASE OF INTERRUPT
1136  003540  012706  001200                  MOV     #STACK,%6           ;SET STACK POINTER
1137  003544  042777  000100  175450          BIC     #100,@DRCSR         ;CLEAR INTERRUPT ENABLE
1138  003552  052777  000101  175442          BIS     #101,@DRCSR
1139  003560  000240                          NOP
1140  003562  042777  000100  175432          BIC     #100,@DRCSR
1141  003570  000401                          BR      .+4                 ;WITH NO INTERRUPT, BRANCH OVER HALT
1142  003572  104000              TINT6:      HLT                         ;INTERRUPT OCCURED
1143  003574  000004                          SCOPE
1144
1145                              ;TEST FOR NO INTERRUPT FROM DEVICE
1146  003576  042737  000340  177776          BIC     #340,@#PSW
1147  003604  052737  000240  177776          BIS     #240,@#PSW          ;RAISE PROCESSOR PRIORITY TO LEVEL 5
1148  003612  012777  003652  175412          MOV     #TINT7,@DRVECA      ;IN CASE OF INTERRUPT
1149  003620  012706  001200                  MOV     #STACK,%6           ;SET STACK POINTER
1150  003624  042777  000100  175370          BIC     #100,@DRCSR         ;CLEAR INTERRUPT ENABLE
1151  003632  052777  000101  175362          BIS     #101,@DRCSR         ;SET INTERRUPT ENABLE AND CSR0
1152  003640  000240                          NOP
1153  003642  042777  000100  175352          BIC     #100,@DRCSR         ;DON'T LEAVE IT SET
1154  003650  000401                          BR      .+4                 ;WITH NO INTERRUPT, BRANCH OVER HALT
1155  003652  104000              TINT7:      HLT                         ;INTERRUPT OCCURED
1156  003654  000004                          SCOPE
1157
1158                              ;TEST FOR NO INTERRUPT FROM DEVICE
1159  003656  042737  000340  177776          BIC     #340,@#PSW
1160  003664  052737  000300  177776          BIS     #300,@#PSW          ;RAISE PROCESSOR PRIORITY TO LEVEL 6
1161  003672  012777  003732  175332          MOV     #TINT8,@DRVECA      ;IN CASE OF INTERRUPT
1162  003700  012706  001200                  MOV     #STACK,%6           ;SET STACK POINTER
1163  003704  042777  000100  175310          BIC     #100,@DRCSR         ;CLEAR INTERRUPT ENABLE
1164  003712  052777  000101  175302          BIS     #101,@DRCSR         ;SET INTERRUPT ENABLE-AND CSR0
1165  003720  042777  000100  175274          BIC     #100,@DRCSR         ;DON'T LEAVE IT SET
1166  003726  000240                          NOP
1167  003730  000401                          BR      .+4                 ;WITH NO INTERRUPT, BRANCH OVER HALT
1168  003732  104000              TINT8:      HLT                         ;INTERRUPT OCCURED
1169  003734  000004                          SCOPE
1170
1171  003736  016777  175272  175266          MOV     DRLVL,@DRVECA       ;FOR FALSE INTERRUPT
1172  003744  005077  175262                  CLR     @DRVECA
1173
1174                              ;END OF TEST ROUTINE
1175  003750  012777  000052  000356  END:     MOV     #'*,@TDBR           ;TYPE '*'
1176  003756  105777  000354          1$:     TSTB    @TCSR
1177  003762  100375                          BPL     1$
1178  003764  005077  000344                  CLR     @TDBR
1179  003770  105777  000342          2$:     TSTB    @TCSR
1180  003774  100375                          BPL     2$
1181  003776  104406                          CKSWR
1182  004000  032777  002000  175210          BIT     #SW10,@SWR          ;LOOP ON SELECTED DR?
1183  004006  001402                          BEQ     4$
1184  004010  000137  001754                  JMP     @#RSTART            ;REPEAT TEST ON DR11C SELECTED
```

```
1185                                        ;STEP TO NEXT DR11-C
1186  004014  012700  000010          4$:     MOV     #10,R0          ;STEPPING CONSTANT
1187  004020  012737  004072  000004          MOV     #5$,@#4         ;SET TIME OUT TRAP
1188  004026  160005                          SUB     R0,R5           ;STEP TO NEXT DR11-C ADDRESS
1189  004030  005715                          TST     (R5)            ;WILL TIME OUT IF NOT AVAILABLE
1190  004032  012705  001222                  MOV     #DRCSR,R5       ;SET TABLE POINTER
1191  004036  160025                          SUB     R0,(R5)+
1192  004040  160025                          SUB     R0,(R5)+
1193  004042  160025                          SUB     R0,(R5)+
1194  004044  160025                          SUB     R0,(R5)+
1195  004046  060025                          ADD     R0,(R5)+
1196  004050  060025                          ADD     R0,(R5)+
1197  004052  060025                          ADD     R0,(R5)+
1198  004054  000137  001754                  JMP     @#RSTART        ;RESTART TEST USING NEXT DR11-C
1199  004060  104406                          CKSWR
1200  004062  032777  001000  175126          BIT     #SW9,@SWR
1201  004070  001004                          BNE     8$
1202  004072  104401                  5$:     TYPE                    ;TYPE 'END PASS'
1203  004074  076675                          MESS3
1204  004076  005267  175144                  INC     PASCNT          ;KEEP TRACK OF PASSES COMPLETED
1205  004102  013700  000042          8$:     MOV     @#42,R0
1206  004106  001405                          BEQ     END1
1207  004110  000005                          RESET
1208  004112  004710                  $ENDAD: JSR     PC,(R0)
1209  004114  000240                          NOP
1210  004116  000240                          NOP
1211  004120  000240                          NOP
1212  004122  000137  001726          END1:   JMP     @#START
1213
1214                                        ;ENTERED WITH SYSTEM TRAP CALL(HLT)
1215                                        ;PRINT OUT THE ERROR PC AND STATUS REGISTER
1216  004126  104406                  .HLT:   CKSWR
1217  004130  037727  175062  020000          BIT     @SWR,#SW13      ;TEST FOR INHIBIT PRINT OUT
1218  004136  001401                          BEQ     .+4             ;BRANCH TO PRINT
1219  004140  000002                          RTI                     ;INHIBIT, RETURN TO MAIN STREAM
1220  004142  012667  000172                  MOV     (6)+,SAVPC      ;PC OF FAILING ROUTINE
1221  004146  012667  000170                  MOV     (6)+,SAVCC      ;CC OF ERROR CONDITION
1222  004152  024646                          CMP     -(6),-(6)       ;REPOSITION THE STACK
1223  004154  105777  000156                  TSTB    @TCSR           ;WAIT FOR FLAG
1224  004160  100375                          BPL     .-4             ;IF NOT UP.
1225  004162  012777  000215  000144          MOV     #215,@TDBR      ;CR
1226  004170  105777  000142                  TSTB    @TCSR
1227  004174  100375                          BPL     .-4
1228  004176  012777  000212  000130          MOV     #212,@TDBR      ;LINE FEED
1229  004204  105777  000126                  TSTB    @TCSR
1230  004210  100375                          BPL     .-4
1231  004212  010267  000110                  MOV     %2,SAVR2        ;SAVE R2
1232  004216  010367  000106                  MOV     %3,SAVR3        ;SAVE R3
1233  004222  010467  000104                  MOV     %4,SAVR4        ;SAVE R4
1234  004226  016702  000106                  MOV     SAVPC,%2
1235  004232  004767  000106                  JSR     %7,PRTAB        ;PRINT OCTAL NUMBER
1236  004236  012777  000240  000070          MOV     #240,@TDBR
1237  004244  105777  000066                  TSTB    @TCSR           ;SPACE BETWEEN WORDS
1238  004250  100375                          BPL     .-4
1239  004252  016702  000064                  MOV     SAVCC,%2
1240  004256  004767  000062                  JSR     %7,PRTAB        ;PRINT OCTAL NUMBER
```

```
1241  004262  004767  000522                    JSR     %7,MOREID       ;DEVICE ADDRESS AND VECTORS
1242  004266  016702  000034                    MOV     SAVR2,%2        ;RESTORE REGISTERS
1243  004272  016703  000032                    MOV     SAVR3,%3
1244  004276  016704  000030                    MOV     SAVR4,%4
1245  004302  023737  000042  000046            CMP     @#42,@#46       ;ARE WE IN ACT-11 AUTO MODE?
1246  004310  001404                            BEQ     1$              ;HALT ON ERROR IF YES
1247  004312  104406                            CKSWR
1248  004314  005777  174676                    TST     @SWR            ;TEST FOR HALT SWITCH
1249  004320  100001                            BPL     .+4
1250  004322  000000                  1$:       HALT                    ;HALT ON ERROR SET
1251  004324  000002                            RTI                     ;RETURN TO MAIN STREAM
1252  004326  000000                  SAVR2:    0
1253  004330  000000                  SAVR3:    0
1254  004332  000000                  SAVR4:    0
1255  004334  177566                  TDBR:     177566                  ;DATA
1256  004336  177564                  TCSR:     177564                  ;STATUS
1257  004340  000000                  SAVPC:    0
1258  004342  000000                  SAVCC:    0
1259
1260  004344  005067  000252          PRTAB:    CLR     BINCT
1261  004350  005067  000244                    CLR     WGTCT
1262  004354  012704  004626                    MOV     #LIST,%4        ;GET LIST ADDRESS
1263  004360  012767  000005  000236            MOV     #5,ASCNT
1264  004366  012767  000007  000220            MOV     #7,SEVEN
1265  004374  012767  000001  000214            MOV     #1,DECML
1266  004402  105777  177730          WAIT1:    TSTB    @TCSR
1267  004406  100375                            BPL     WAIT1
1268  004410  005702                            TST     %2
1269  004412  100404                            BMI     MINUS           ;NEG SIGN PRINT 1
1270  004414  012777  000260  177712            MOV     #260,@TDBR      ;POS SIGN PRINT 0
1271  004422  000403                            BR      STAR
1272  004424  012777  000261  177702  MINUS:    MOV     #261,@TDBR
1273  004432  016703  000156          STAR:     MOV     SEVEN,%3        ;PUT MASK IN R3
1274  004436  010267  000150                    MOV     %2,TOODLE       ;GET READY TO DOODLE NUMBER IN TOODLE
1275  004442  005167  000144                    COM     TOODLE          ;COMPENSATES FOR COMPLEMENT DURING BIC
1276  004446  046703  000140                    BIC     TOODLE,%3       ;AND IN OCTAL CHARACTER
1277  004452  001410                            BEQ     WRTOC           ;ZERO, WRITE 0 IN LIST
1278  004454  066767  000136  000136  MKNUM:    ADD     DECML,WGTCT     ;COUNT UP TO
1279  004462  005267  000134                    INC     BINCT           ;AND RECORD
1280  004466  026703  000126                    CMP     WGTCT,%3        ;SAME BINARY WEIGHT
1281  004472  001370                            BNE     MKNUM           ;KEEP COUNTN
1282  004474  062767  000260  000120  WRTOC:    ADD     #260,BINCT      ;ADD ASCII PREFIX
1283  004502  016724  000114                    MOV     BINCT,(4)+      ;WRITE ASCII CHAR IN LIST
1284  004506  066767  000102  000102            ADD     SEVEN,DECML     ;EXPAND BINARY WEIGHT
1285  004514  005067  000100                    CLR     WGTCT
1286  004520  005067  000076                    CLR     BINCT
1287  004524  005367  000074                    DEC     ASCNT
1288  004530  001410                            BEQ     XLIST           ;5 CHAR IN LIST
1289  004532  012703  000003                    MOV     #3,%3           ;SET X3 FOR ADD LOOP
1290  004536  066767  000052  000050  MOADD:    ADD     SEVEN,SEVEN     ;MAKING SEVENTY BY SEVEN
1291  004544  005303                            DEC     %3
1292  004546  001373                            BNE     MOADD
1293  004550  000730                            BR      STAR            ;NX SEVEN SET GET NX OCTAL
1294  004552  012767  000005  000044  XLIST:    MOV     #5,ASCNT        ;SEND 5 CHAR TO TTY
1295  004560  105777  177552          WAIT2:    TSTB    @TCSR
1296  004564  100375                            BPL     WAIT2
```

```
1297  004566  014477  177542          MOV     -(4),@TDBR
1298  004572  005367  000026          DEC     ASCNT
1299  004576  001401                  BEQ     HDFHM           ;FINISH PRINTING GET NXT NUM
1300  004600  000767                  BR      WAIT2
1301  004602  105777  177530  HDFHM:  TSTB @TCSR
1302  004606  100375                  BPL     .-4
1303  004610  000207                  RTS     %7              ;HEAD FOR HOME
1304  004612  000000          TOODLE: 0
1305  004614  000000          SEVEN:  0
1306  004616  000000          DECML:  0
1307  004620  000000          WGTCT:  0
1308  004622  000000          BINCT:  0
1309  004624  000000          ASCNT:  0
1310  004626  000000          LIST:   0
1311  004630  000000                  0
1312  004632  000000                  0
1313  004634  000000                  0
1314  004636  000000                  0
1315                          ;SCOPE LOOP ROUTINE ENTERED BY USER TRAP
1316  004640  022606          SCOPEB: CMP     (6)+,%6         ;REPOSITION THE STACK
1317  004642  012637  177776          MOV     (6)+,@#PSW
1318  004646  000177  000120          JMP     @RETURN         ;SCOPE RETURN
1319
1320                          ;SCOPE OR/AND ITERATION LOOP FOR EACH TEST 4000 TIMES
1321  004652  104406          .SCOPE: CKSWR
1322  004654  032777  040000  174334          BIT     #SW14,@SWR      ;TEST SR FOR SCOPE
1323  004662  001366                  BNE     SCOPEB          ;YES SCOPE
1324  004664  005737  001240          TST     @#XORFLG
1325  004670  100012                  BPL     1$
1326  004672  013746  000004          MOV     @#4,-(%6)
1327  004676  012737  005060  000004          MOV     #XOR,@#4
1328  004704  012737  000031  177060          MOV     #31,@#177060
1329  004712  012637  000004          MOV     (%6)+,@#4
1330  004716  104406          1$:     CKSWR
1331  004720  032777  004000  174270          BIT     #SW11,@SWR      ;NO - TEST FOR ITERATION
1332  004726  001014                  BNE     SCOPEA          ;INHIBIT ITERATION
1333  004730  005767  174312          TST     PASCNT          ;ARE WE IN FIRST PASS?
1334  004734  001411                  BEQ     SCOPEA          ;BRANCH IF YES; INHIBIT ITERATIONS
1335  004736  026767  000026  000022          CMP     SCOPEF,ICOUNT
1336  004744  001403                  BEQ     SCOPEG          ;EXIT - DONE
1337  004746  005267  000016          INC     SCOPEF          ;INCREMENT COUNT
1338  004752  000732                  BR      SCOPEB          ;LOOP SOME MORE
1339  004754  005067  000010          SCOPEG: CLR     SCOPEF          ;CLEAR COUNT
1340  004760  011667  000006          SCOPEA: MOV     @%6,RETURN      ;SAVE SCOPE RETURN POINTER
1341  004764  000002                  RTI                     ;RETURN INLINE-NEXT TEST
1342  004766  004000          ICOUNT: 4000
1343  004770  000000          SCOPEF: 0                       ;COUNT LOCATION FOR ITERATION LOOP
1344  004772  002010          RETURN: BEGIN                   ;ADDRESS OF LAST TEST
1345  004774  000167  173200          JMP     200
1346
1347  005000  022626          XOR:    CMP     (%6)+,(%6)+
1348  005002  012637  000004          MOV     (%6)+,@#4
1349  005006  000714                  BR      SCOPEB
1350                          ;PRINT DEVICE ADDRESS AND VECTOR
1351  005010  012777  000240  177316  MOREID: MOV     #240,@TDBR
1352  005016  105777  177314          TSTB    @TCSR
```

```
1353  005022  100375                        BPL     .-4
1354  005024  013702  001222                MOV     @#DRCSR,%2
1355  005030  004767  177310                JSR     %7,PRTAB
1356  005034  012777  000240  177272        MOV     #240,@TDBR
1357  005042  105777  177270                TSTB    @TCSR
1358  005046  100375                        BPL     .-4
1359  005050  016702  174156                MOV     DRVECA,%2
1360  005054  004767  177264                JSR     %7,PRTAB
1361  005060  012777  000215  177246        MOV     #215,@TDBR
1362  005066  105777  177244                TSTB    @TCSR
1363  005072  100375                        BPL     .-4
1364  005074  012777  000212  177232        MOV     #212,@TDBR
1365  005102  105777  177230                TSTB    @TCSR
1366  005106  100375                        BPL     .-4
1367  005110  005077  177220                CLR     @TDBR
1368  005114  105777  177216                TSTB    @TCSR
1369  005120  100375                        BPL     .-4
1370  005122  000207                        RTS     %7              ;BACK TO PRINT
1371
1372                                  ;ENTER HERE FOR POWER FAIL
1373
1374  005124  010046                PFAIL:  MOV     %0,-(6)         ;SAVE REGISTER OR STACK
1375  005126  010146                        MOV     %1,-(6)         ;WHEN POWERING DOWN
1376  005130  010246                        MOV     %2,-(6)
1377  005132  010346                        MOV     %3,-(6)
1378  005134  010446                        MOV     %4,-(6)
1379  005136  010546                        MOV     %5,-(6)
1380  005140  016746  172660                MOV     24,-(6)
1381  005144  010637  005160                MOV     %6,@#SAVR6      ;STORE STACK POSITION
1382  005150  012737  005162  000024        MOV     #RESTAR,@#24
1383  005156  000000                        HALT                    ;HALT ON POWER DOWN NORMAL
1384  005160  000000                SAVR6:  0                       ;STACK IS SAVED HERE
1385  005162  016706  177772        RESTAR:MOV     SAVR6,%6        ;RESTORE REGISTER OFF STACK
1386  005166  012667  172632                MOV     (6)+,24         ;WHEN POWERING UP
1387  005172  012605                        MOV     (6)+,%5
1388  005174  012604                        MOV     (6)+,%4
1389  005176  012603                        MOV     (6)+,%3
1390  005200  012602                        MOV     (6)+,%2
1391  005202  012601                        MOV     (6)+,%1
1392  005204  012600                        MOV     (6)+,%0
1393  005206  000137  001754                JMP     @#RSTART
1394
1395                                  ;ENTER HERE FOR UNIQUE SELECTION OF DR11C
1396
1397  005212  000000                SPEC0:  HALT                    ;PLACE ADDRESS OF DR11-C CONTROL STATUS
1398  005214  104406                        CKSWR
1399  005216  017701  173774                MOV     @SWR,R1
1400  005222  004737  005246                JSR     PC,@#SPEC1
1401  005226  000000                        HALT
1402  005230  104406                        CKSWR
1403  005232  017701  173760                MOV     @SWR,R1
1404  005236  004737  005276                JSR     PC,@#SPEC2
1405  005242  000137  001726                JMP     @#START
1406
1407  005246  012700  001200        SPEC1:  MOV     #RCSR,R0        ;SET TABLE ADDRESS
1408  005252  010120                        MOV     R1,(R0)+        ;LOAD INTO TABLE STARTING AT RCSR
```

```
1409  005254  062701  000002          ADD     #2,R1           ;STEP TO ADDRESS OF DROUTBUF
1410  005260  010120                  MOV     R1,(R0)+        ;LOAD INTO TABLE
1411  005262  062701  000002          ADD     #2,R1           ;STEP TO ADDRESS OF DRINBUF
1412  005266  010120                  MOV     R1,(R0)+        ;LOAD INTO TABLE
1413  005270  005301                  DEC     R1              ;FORM ADDRESS OF DROUTBUF+1
1414  005272  010120                  MOV     R1,(R0)+        ;LOAD INTO TABLE
1415  005274  000207                  RTS     PC
1416
1417  005276  012700  001210  SPEC2:  MOV     #RCSR1,R0
1418  005302  010120                  MOV     R1,(R0)+        ;LOAD INTO TABLE
1419  005304  005721                  TST     (R1)+
1420  005306  010120                  MOV     R1,(R0)+
1421  005310  005721                  TST     (R1)+
1422  005312  010120                  MOV     R1,(R0)+
1423  005314  000207                  RTS     PC
1424
1425                                  .LIST   ME
1426  005316                  TYP:
1427                          .SBTTL  TYPE ROUTINE
1428
1429                          ;;*****************************************************************
1430                          ;*ROUTINE TO TYPE ASCIZ MESSAGE. MESSAGE MUST TERMINATE WITH A 0 BYTE.
1431                          ;*THE ROUTINE WILL INSERT A NUMBER OF NULL CHARACTERS AFTER A LINE FEED.
1432                          ;*NOTE1:        $NULL CONTAINS THE CHARACTER TO BE USED AS THE FILLER CHARACTER.
1433                          ;*NOTE2:        $FILLS CONTAINS THE NUMBER OF FILLER CHARACTERS REQUIRED.
1434                          ;*NOTE3:        $FILLC CONTAINS THE CHARACTER TO FILL AFTER.
1435                          ;*
1436                          ;*CALL:
1437                          ;*1) USING A TRAP INSTRUCTION
1438                          ;*      TYPE    ,MESADR         ;;MESADR IS FIRST ADDRESS OF AN ASCIZ STRING
1439                          ;*OR
1440                          ;*      TYPE
1441                          ;*      MESADR
1442                          ;*
1443
1444  005316  105767  000223  $TYPE:  TSTB    $TPFLG          ;;IS THERE A TERMINAL?
1445  005322  100002                  BPL     1$              ;;BR IF YES
1446  005324  000000                  HALT                    ;;HALT HERE IF NO TERMINAL
1447  005326  000407                  BR      3$              ;;LEAVE
1448  005330  010046          1$:     MOV     R0,-(SP)        ;;SAVE R0
1449  005332  017600  000002          MOV     @2(SP),R0       ;;GET ADDRESS OF ASCIZ STRING
1450  005336  112046          2$:     MOVB    (R0)+,-(SP)     ;;PUSH CHARACTER TO BE TYPED ONTO STACK
1451  005340  001005                  BNE     4$              ;;BR IF IT ISN'T THE TERMINATOR
1452  005342  005726                  TST     (SP)+           ;;IF TERMINATOR POP IT OFF THE STACK
1453  005344  012600          60$:    MOV     (SP)+,R0        ;;RESTORE R0
1454  005346  062716  000002  3$:     ADD     #2,(SP)         ;;ADJUST RETURN PC
1455  005352  000002                  RTI                     ;;RETURN
1456  005354  122716  000011  4$:     CMPB    #HT,(SP)        ;;BRANCH IF <HT>
1457  005360  001430                  BEQ     8$
1458  005362  122716  000200          CMPB    #CRLF,(SP)      ;;BRANCH IF NOT <CRLF>
1459  005366  001006                  BNE     5$
1460  005370  005726                  TST     (SP)+           ;;POP  <CR><LF> EQUIV
1461  005372  104401                  TYPE                    ;;TYPE A CR AND LF
1462  005374  005547                  $CRLF
1463  005376  105067  000130          CLRB    $CHARCNT        ;;CLEAR CHARACTER COUNT
1464  005402  000755                  BR      2$              ;;GET NEXT CHARACTER
```

```
1465  005404  004767  000056          5$:     JSR     PC,$TYPEC       ;;GO TYPE THIS CHARACTER
1466  005410  126726  000130          6$:     CMPB    $FILLC,(SP)+    ;;IS IT TIME FOR FILLER CHARS.?
1467  005414  001350                          BNE     2$              ;;IF NO GO GET NEXT CHAR.
1468  005416  016746  000120                  MOV     $NULL,-(SP)     ;;GET # OF FILLER CHARS. NEEDED
1469                                                                  ;;AND THE NULL CHAR.
1470  005422  105366  000001          7$:     DECB    1(SP)           ;;DOES A NULL NEED TO BE TYPED?
1471  005426  002770                          BLT     6$              ;;BR IF NO--GO POP THE NULL OFF OF STACK
1472  005430  004767  000032                  JSR     PC,$TYPEC       ;;GO TYPE A NULL
1473  005434  105367  000072                  DECB    $CHARCNT        ;;DO NOT COUNT AS A COUNT
1474  005440  000770                          BR      7$              ;;LOOP
1475
1476                                  ;HORIZONTAL TAB PROCESSOR
1477
1478  005442  112716  000040          8$:     MOVB    #' ,(SP)        ;;REPLACE TAB WITH SPACE
1479  005446  004767  000014          9$:     JSR     PC,$TYPEC       ;;TYPE A SPACE
1480  005452  132767  000007  000052          BITB    #7.,$CHARCNT    ;;BRANCH IF NOT AT
1481  005460  001372                          BNE     9$              ;;TAB STOP
1482  005462  005726                          TST     (SP)+           ;;POP SPACE OFF STACK
1483  005464  000724                          BR      2$              ;;GET NEXT CHARACTER
1484  005466  105777  000044          $TYPEC: TSTB    @$TPS           ;;WAIT UNTIL PRINTER IS READY
1485  005472  100375                          BPL     $TYPEC
1486  005474  116677  000002  000036          MOVB    2(SP),@$TPB     ;;LOAD CHAR TO BE TYPED INTO DATA REG.
1487  005502  122766  000015  000002          CMPB    #CR,2(SP)       ;;IS CHARACTER A CARRIAGE RETURN?
1488  005510  001003                          BNE     1$              ;;BRANCH IF NO
1489  005512  105067  000014                  CLRB    $CHARCNT        ;;YES--CLEAR CHARACTER COUNT
1490  005516  000406                          BR      $TYPEX          ;;EXIT
1491  005520  122766  000012  000002  1$:     CMPB    #LF,2(SP)       ;;IS CHARACTER A LINE FEED?
1492  005526  001402                          BEQ     $TYPEX          ;;BRANCH IF YES
1493  005530  105227                          INCB    (PC)+           ;;COUNT THE CHARACTER
1494  005532  000000          $CHARCNT:.WORD  0               ;;CHARACTER COUNT STORAGE
1495  005534  000207          $TYPEX: RTS     PC
1496
1497  005536  177564          $TPS:   .WORD   177564          ;;TTY PRINTER STATUS REG. ADDRESS
1498  005540  177566          $TPB:   .WORD   177566          ;;TTY PRINTER BUFFER REG. ADDRESS
1499  005542     000          $NULL:  .BYTE   0               ;;CONTAINS NULL CHARACTER FOR FILLS
1500  005543     002          $FILLS: .BYTE   2               ;;CONTAINS # OF FILLER CHARACTERS REQUIRED
1501  005544     012          $FILLC: .BYTE   12              ;;INSERT FILL CHARS. AFTER A "LINE FEED"
1502  005545     000          $TPFLG: .BYTE   0               ;;"TERMINAL AVAILABLE" FLAG (BIT<07>=0=YES)
1503  005546     077          $QUES:  .ASCII  "?"             ;;QUESTION MARK
1504  005547     015          $CRLF:  .ASCII  <15>            ;;CARRAIGE RETURN
1505  005550  000012          $LF:    .ASCIZ  <12>            ;;LINEFEED
1506                          .SBTTL  BINARY TO OCTAL (ASCII) AND TYPE
1507
1508                          ;;******************************************************************
1509                          ;*THIS ROUTINE IS USED TO CHANGE A 16-BIT BINARY NUMBER TO A 6-DIGIT
1510                          ;*OCTAL (ASCII) NUMBER AND TYPE IT.
1511                          ;*$TYPOS---ENTER HERE TO SETUP SUPPRESS ZEROS AND NUMBER OF DIGITS TO TYPE
1512                          ;*CALL:
1513                          ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
1514                          ;*      TYPOS                   ;;CALL FOR TYPEOUT
1515                          ;*      .BYTE   N               ;;N=1 TO 6 FOR NUMBER OF DIGITS TO TYPE
1516                          ;*      .BYTE   M               ;;M=1 OR 0
1517                          ;*                                      ;;1=TYPE LEADING ZEROS
1518                          ;*                                      ;;0=SUPPRESS LEADING ZEROS
1519                          ;*
1520                          ;*$TYPON----ENTER HERE TO TYPE OUT WITH THE SAME PARAMETERS AS THE LAST
```

```
1521                                    ;*$TYPOS OR $TYPOC
1522                                    ;*CALL:
1523                                    ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
1524                                    ;*      TYPON                   ;;CALL FOR TYPEOUT
1525                                    ;*
1526                                    ;*$TYPOC---ENTER HERE FOR TYPEOUT OF A 16 BIT NUMBER
1527                                    ;*CALL:
1528                                    ;*      MOV     NUM,-(SP)       ;;NUMBER TO BE TYPED
1529                                    ;*      TYPOC                   ;;CALL FOR TYPEOUT
1530
1531  005552  017646  000000        $TYPOS: MOV     @(SP),-(SP)     ;;PICKUP THE MODE
1532  005556  116667  000001  000211        MOVB    1(SP),$OFILL    ;;LOAD ZERO FILL SWITCH
1533  005564  112667  000207                MOVB    (SP)+,$OMODE+1  ;;NUMBER OF DIGITS TO TYPE
1534  005570  062716  000002                ADD     #2,(SP)         ;;ADJUST RETURN ADDRESS
1535  005574  000406                        BR      $TYPON
1536  005576  112767  000001  000171 $TYPOC: MOVB    #1,$OFILL       ;;SET THE ZERO FILL SWITCH
1537  005604  112767  000006  000165        MOVB    #6,$OMODE+1     ;;SET FOR SIX(6) DIGITS
1538  005612  112767  000005  000154 $TYPON: MOVB    #5,$OCNT        ;;SET THE ITERATION COUNT
1539  005620  010346                        MOV     R3,-(SP)        ;;SAVE R3
1540  005622  010446                        MOV     R4,-(SP)        ;;SAVE R4
1541  005624  010546                        MOV     R5,-(SP)        ;;SAVE R5
1542  005626  116704  000145                MOVB    $OMODE+1,R4     ;;GET THE NUMBER OF DIGITS TO TYPE
1543  005632  005404                        NEG     R4
1544  005634  062704  000006                ADD     #6,R4           ;;SUBTRACT IT FOR MAX. ALLOWED
1545  005640  110467  000132                MOVB    R4,$OMODE       ;;SAVE IT FOR USE
1546  005644  116704  000125                MOVB    $OFILL,R4       ;;GET THE ZERO FILL SWITCH
1547  005650  016605  000012                MOV     12(SP),R5       ;;PICKUP THE INPUT NUMBER
1548  005654  005003                        CLR     R3              ;;CLEAR THE OUTPUT WORD
1549  005656  006105                1$:     ROL     R5              ;;ROTATE MSB INTO "C"
1550  005660  000404                        BR      3$              ;;GO DO MSB
1551  005662  006105                2$:     ROL     R5              ;;FORM THIS DIGIT
1552  005664  006105                        ROL     R5
1553  005666  006105                        ROL     R5
1554  005670  010503                        MOV     R5,R3
1555  005672  006103                3$:     ROL     R3              ;;GET LSB OF THIS DIGIT
1556  005674  105367  000076                DECB    $OMODE          ;;TYPE THIS DIGIT?
1557  005700  100016                        BPL     7$              ;;BR IF NO
1558  005702  042703  177770                BIC     #177770,R3      ;;GET RID OF JUNK
1559  005706  001002                        BNE     4$              ;;TEST FOR 0
1560  005710  005704                        TST     R4              ;;SUPPRESS THIS 0?
1561  005712  001403                        BEQ     5$              ;;BR IF YES
1562  005714  005204                4$:     INC     R4              ;;DON'T SUPPRESS ANYMORE 0'S
1563  005716  052703  000060                BIS     #'0,R3          ;;MAKE THIS DIGIT ASCII
1564  005722  052703  000040        5$:     BIS     #' ,R3          ;;MAKE ASCII IF NOT ALREADY
1565  005726  110367  000040                MOVB    R3,8$           ;;SAVE FOR TYPING
1566  005732  104401  005772                TYPE    ,8$             ;;GO TYPE THIS DIGIT
1567  005736  105367  000032        7$:     DECB    $OCNT           ;;COUNT BY 1
1568  005742  003347                        BGT     2$              ;;BR IF MORE TO DO
1569  005744  002402                        BLT     6$              ;;BR IF DONE
1570  005746  005204                        INC     R4              ;;INSURE LAST DIGIT ISN'T A BLANK
1571  005750  000744                        BR      2$              ;;GO DO THE LAST DIGIT
1572  005752  012605                6$:     MOV     (SP)+,R5        ;;RESTORE R5
1573  005754  012604                        MOV     (SP)+,R4        ;;RESTORE R4
1574  005756  012603                        MOV     (SP)+,R3        ;;RESTORE R3
1575  005760  016666  000002  000004        MOV     2(SP),4(SP)     ;;SET THE STACK FOR RETURNING
1576  005766  012616                        MOV     (SP)+,(SP)
```

```
1577  005770  000002                        RTI                     ;;RETURN
1578  005772  000                 B$:       .BYTE   0               ;;STORAGE FOR ASCII DIGIT
1579  005773  000                           .BYTE   0               ;;TERMINATOR FOR TYPE ROUTINE
1580  005774  000                 $OCNT:    .BYTE   0               ;;OCTAL DIGIT COUNTER
1581  005775  000                 $OFILL:   .BYTE   0               ;;ZERO FILL SWITCH
1582  005776  000000              $OMODE:   .WORD   0               ;;NUMBER OF DIGITS TO TYPE
1583                                .SBTTL  TTY INPUT ROUTINE
1584
1585                                ;;****************************** ********************************
1586  006000  177560                $TKS:   .WORD   177560          ;;TTY KBD STATUS
1587  006002  177562                $TKB:   .WORD   177562          ;;TTY KBD BUFFER
1588                                .ENABL  LSB
1589
1590                                ;;*********************************************************************
1591                                ;*SOFTWARE SWITCH REGISTER CHANGE ROUTINE.
1592                                ;*ROUTINE IS ENTERED FROM THE TRAP HANDLER, AND WILL
1593                                ;*SERVICE THE TEST FOR CHANGE IN SOFTWARE SWITCH REGISTER TRAP CALL
1594                                ;*WHEN OPERATING IN TTY FLAG MODE.
1595  006004  022767  000176  173204 $CKSWR: CMP     #SWREG,SWR      ;;IS THE SOFT-SWR SELECTED?
1596  006012  001074                        BNE     15$             ;;BRANCH IF NO
1597  006014  105777  177760               TSTB    @$TKS           ;;CHAR THERE?
1598  006020  100071                        BPL     15$             ;;IF NO, DON'T WAIT AROUND
1599  006022  117746  177754               MOVB    @$TKB,-(SP)     ;;SAVE THE CHAR
1600  006026  042716  177600               BIC     #^C177,(SP)     ;;STRIP-OFF THE ASCII
1601  006032  022726  000007               CMP     #7,(SP)+        ;;IS IT A CONTROL G?
1602  006036  001062                        BNE     15$             ;;NO, RETURN TO USER
1603  006040  126727  000514  000001       CMPB    $AUTOB,#1       ;;ARE WE RUNNING IN AUTO-MODE?
1604  006046  001456                        BEQ     15$             ;;BRANCH IF YES
1605
1606  006050  104401  006531               TYPE    ,$CNTLG         ;;ECHO THE CONTROL-G (^G)
1607  006054  104401  006536       $GTSWR: TYPE    ,$MSWR          ;;TYPE CURRENT CONTENTS
1608  006060  016746  172112               MOV     SWREG,-(SP)     ;;SAVE SWREG FOR TYPEOUT
1609  006064  104402                        TYPOC                   ;;GO TYPE--OCTAL ASCII(ALL DIGITS)
1610  006066  104401  006547               TYPE    ,$MNEW          ;;PROMPT FOR NEW SWR
1611  006072  005046               19$:     CLR     -(SP)           ;;CLEAR COUNTER
1612  006074  005046                        CLR     -(SP)           ;;THE NEW SWR
1613  006076  105777  177676       7$:     TSTB    @$TKS           ;;CHAR THERE?
1614  006102  100375                        BPL     7$              ;;IF NOT TRY AGAIN
1615
1616  006104  117746  177672               MOVB    @$TKB,-(SP)     ;;PICK UP CHAR
1617  006110  042716  177600               BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
1618
1619
1620
1621  006114  021627  000025       9$:     CMP     (SP),#25        ;;IS IT A CONTROL-U?
1622  006120  001005                        BNE     10$             ;;BRANCH IF NOT
1623  006122  104401  006524               TYPE    ,$CNTLU         ;;YES, ECHO CONTROL-U (^U)
1624  006126  062706  000006       20$:    ADD     #6,SP           ;;IGNORE PREVIOUS INPUT
1625  006132  000757                        BR      19$             ;;LET'S TRY IT AGAIN
1626
1627
1628  006134  021627  000015       10$:    CMP     (SP),#15        ;;IS IT A <CR>?
1629  006140  001022                        BNE     16$             ;;BRANCH IF NO
1630  006142  005766  000004               TST     4(SP)           ;;YES, IS IT THE FIRST CHAR'
1631  006146  001403                        BEQ     11$             ;;BRANCH IF YES
1632  006150  016677  000002  173040       MOV     2(SP),@SWR      ;;SAVE NEW SWR
```

```
1633  006156  062706  000006          11$:    ADD     #6,SP           ;;CLEAR UP STACK
1634  006162  104401  005547          14$:    TYPE    ,$CRLF          ;;ECHO <CR> AND <LF>
1635  006166  126727  000367  000001          CMPB    $INTAG,#1       ;;RE-ENABLE TTY KBD INTERRUPTS?
1636  006174  001003                          BNE     15$             ;;BRANCH IF NOT
1637  006176  012777  000100  177574          MOV     #100,@$TKS      ;;RE-ENABLE TTY KBD INTERRUPTS
1638  006204  000002                  15$:    RTI                     ;;RETURN
1639  006206  004767  177254          16$:    JSR     PC,$TYPEC       ;;ECHO CHAR
1640  006212  021627  000060                  CMP     (SP),#60        ;;CHAR < 0?
1641  006216  002420                          BLT     18$             ;;BRANCH IF YES
1642  006220  021627  000067                  CMP     (SP),#67        ;;CHAR > 7?
1643  006224  003015                          BGT     18$             ;;BRANCH IF YES
1644  006226  042726  000060                  BIC     #60,(SP)+       ;;STRIP-OFF ASCII
1645  006232  005766  000002                  TST     2(SP)           ;;IS THIS THE FIRST CHAR
1646  006236  001403                          BEQ     17$             ;;BRANCH IF YES
1647  006240  006316                          ASL     (SP)            ;;NO, SHIFT PRESENT
1648  006242  006316                          ASL     (SP)            ;;   CHAR OVER TO MAKE
1649  006244  006316                          ASL     (SP)            ;;   ROOM FOR NEW ONE.
1650  006246  005266  000002          17$:    INC     2(SP)           ;;KEEP COUNT OF CHAR
1651  006252  056616  177776                  BIS     -2(SP),(SP)     ;;SET IN NEW CHAR
1652  006256  000707                          BR      7$              ;;GET THE NEXT ONE
1653  006260  104401  005546          18$:    TYPE    ,$QUES          ;;TYPE ?<CR><LF>
1654  006264  000720                          BR      20$             ;;SIMULATE CONTROL-U
1655                                  .DSABL  LSB
1656
1657
1658                                  ;;**************************************************
1659                                  ;*THIS ROUTINE WILL INPUT A SINGLE CHARACTER FROM THE TTY
1660                                  ;*CALL:
1661                                  ;*      RDCHR                   ;;INPUT A SINGLE CHARACTER FROM THE TTY
1662                                  ;*      RETURN HERE             ;;CHARACTER IS ON THE STACK
1663                                  ;*                              ;;WITH PARITY BIT STRIPPED OFF
1664                                  ;
1665
1666  006266  011646          $RDCHR: MOV     (SP),-(SP)      ;;PUSH DOWN THE PC
1667  006270  016666  000004  000002  MOV     4(SP),2(SP)     ;;SAVE THE PS
1668  006276  105777  177476  1$:     TSTB    @$TKS           ;;WAIT FOR
1669  006302  100375                  BPL     1$              ;;A CHARACTER
1670  006304  117766  177472  000004  MOVB    @$TKB,4(SP)     ;;READ THE TTY
1671  006312  042766  177600  000004  BIC     #^C<177>,4(SP)  ;;GET RID OF JUNK IF ANY
1672  006320  026627  000004  000023  CMP     4(SP),#23       ;;IS IT A CONTROL-S?
1673  006326  001013                  BNE     3$              ;;BRANCH IF NO
1674  006330  105777  177444  2$:     TSTB    @$TKS           ;;WAIT FOR A CHARACTER
1675  006334  100375                  BPL     2$              ;;LOOP UNTIL ITS THERE
1676  006336  117746  177440          MOVB    @$TKB,-(SP)     ;;GET CHARACTER
1677  006342  042716  177600          BIC     #^C177,(SP)     ;;MAKE IT 7-BIT ASCII
1678  006346  022627  000021          CMP     (SP)+,#21       ;;IS IT A CONTROL-Q?
1679  006352  001366                  BNE     2$              ;;IF NOT DISCARD IT
1680  006354  000750                  BR      1$              ;;YES, RESUME
1681  006356  026627  000004  000140  3$:     CMP     4(SP),#140      ;;IS IT UPPER CASE?
1682  006364  002407                  BLT     4$              ;;BRANCH IF YES
1683  006366  026627  000004  000175  CMP     4(SP),#175      ;;IS IT A SPECIAL CHAR?
1684  006374  003003                  BGT     4$              ;;BRANCH IF YES
1685  006376  042766  000040  000004  BIC     #40,4(SP)       ;;MAKE IT UPPER CASE
1686  006404  000002                  4$:     RTI             ;;GO BACK TO USER
1687                                  ;;**************************************************
1688                                  ;*THIS ROUTINE WILL INPUT A STRING FROM THE TTY
```

```
1689                                    ;*CALL:
1690                                    ;*      RDLIN                   ;;INPUT A STRING FROM THE TTY
1691                                    ;*      RETURN HERE             ;;ADDRESS OF FIRST CHARACTER WILL BE ON THE STACK
1692                                    ;*                              ;;TERMINATOR WILL BE A BYTE OF ALL 0'S
1693
1694  006406  010346                    $RDLIN: MOV     R3,-(SP)        ;;SAVE R3
1695  006410  012703  006514            1$:     MOV     #$TTYIN,R3      ;;GET ADDRESS
1696  006414  022703  006524            2$:     CMP     #$TTYIN+8.,R3   ;;BUFFER FULL?
1697  006420  101405                            BLOS    4$              ;;BR IF YES
1698  006422  104407                            RDCHR                   ;;GO READ ONE CHARACTER FROM THE TTY
1699  006424  112613                            MOVB    (SP)+,(R3)      ;;GET CHARACTER
1700  006426  122713  000177            10$:    CMPB    #177,(R3)       ;;IS IT A RUBOUT
1701  006432  001003                            BNE     3$              ;;SKIP IF NOT
1702  006434  104401  005546            4$:     TYPE    ,$QUES          ;;TYPE A '?'
1703  006440  000763                            BR      1$              ;;CLEAR THE BUFFER AND LOOP
1704  006442  111367  000044            3$:     MOVB    (R3),9$         ;;ECHO THE CHARACTER
1705  006446  104401  006512                    TYPE    ,9$
1706  006452  122723  000015                    CMPB    #15,(R3)+       ;;CHECK FOR RETURN
1707  006456  001356                            BNE     2$              ;;LOOP IF NOT RETURN
1708  006460  105063  177777                    CLRB    -1(R3)          ;;CLEAR RETURN (THE 15)
1709  006464  104401  005550                    TYPE    ,$L             ;;TYPE A LINE FEED
1710  006470  012603                            MOV     (SP)+,R3        ;;RESTORE R3
1711  006472  011646                            MOV     (SP),-(SP)      ;;ADJUST THE STACK AND PUT ADDRESS OF THE
1712  006474  016666  000004  000002            MOV     4(SP),2(SP)     ;;      FIRST ASCII CHARACTER ON IT
1713  006502  012766  006514  000004            MOV     #$TTYIN,4(SP)
1714  006510  000002                            RTI                     ;;RETURN
1715  006512     000                    9$:     .BYTE   0               ;;STORAGE FOR ASCII CHAR. TO TYPE
1716  006513     000                            .BYTE   0               ;;TERMINATOR
1717  006514  000010                    $TTYIN: .BLKB   8.              ;;RESERVE 8 BYTES FOR TTY INPUT
1718  006524  052536  005015     000    $CNTLU: .ASCIZ  /^U/<15><12>    ;;CONTROL "U"
1719  006531     136  006507  000012    $CNTLG: .ASCIZ  /^G/<15><12>    ;;CONTROL "G"
1720  006536  005015  053523  020122    $MSWR:  .ASCIZ  <15><12>/SWR = /
1721  006544  020075     000
1722  006547     040  047040  053505    $MNEW:  .ASCIZ  /  NEW = /
1723  006554  036440  000040
1724  006560     000                    $AUTOB: .BYTE   0       ;;AUTO MODE FLAG
1725  006561     000                    $INTAG: .BYTE   0       ;;INTERRUPT MODE FLAG
1726                                    .SBTTL  TRAP DECODER
1727
1728                                    ;;**************************************************************
1729                                    ;*THIS ROUTINE WILL PICKUP THE LOWER BYTE OF THE "TRAP" INSTRUCTION
1730                                    ;*AND USE IT TO INDEX THROUGH THE TRAP TABLE FOR THE STARTING ADDRESS
1731                                    ;*OF THE DESIRED ROUTINE. THEN USING THE ADDRESS OBTAINED IT WILL
1732                                    ;*GO TO THAT ROUTINE.
1733
1734  006562  010046                    $TRAP:  MOV     R0,-(SP)        ;;SAVE R0
1735  006564  016600  000002                    MOV     2(SP),R0        ;;GET TRAP ADDRESS
1736  006570  005740                            TST     -(R0)           ;;BACKUP BY 2
1737  006572  111000                            MOVB    (R0),R0         ;;GET RIGHT BYTE OF TRAP
1738  006574  006300                            ASL     R0              ;;POSITION FOR INDEXING
1739  006576  016000  006616                    MOV     $TRPAD(R0),R0   ;;INDEX TO TABLE
1740  006602  000200                            RTS     R0              ;;GO TO ROUTINE
1741
1742
1743                                    ;;THIS IS USE TO HANDLE THE "GETPRI" MACRO
1744
```

```
1745  006604  011646                  $TRAP2: MOV     (SP),-(SP)      ;;MOVE THE PC DOWN
1746  006606  016666  000004  000002          MOV     4(SP),2(SP)     ;;MOVE THE PSW DOWN
1747  006614  000002                          RTI                     ;;RESTORE THE PSW
1748
1749                                  .SBTTL  TRAP TABLE
1750
1751                                  ;*THIS TABLE CONTAINS THE STARTING ADDRESSES OF THE ROUTINES CALLED
1752                                  ;*BY THE "TRAP" INSTRUCTION.
1753
1754                                  ;       ROUTINE
1755                                  ;       -------
1756  006616  006604                  $TRPAD: .WORD   $TRAP2
1757  006620  005316                          $TYPE   ;;CALL=TYPE     TRAP+1(104401)  TTY TYPEOUT ROUTINE
1758  006622  005576                          $TYPOC  ;;CALL=TYPOC    TRAP+2(104402)  TYPE OCTAL NUMBER (WITH LEADING ZEROS)
1759  006624  005552                          $TYPOS  ;;CALL=TYPOS    TRAP+3(104403)  TYPE OCTAL NUMBER (NO LEADING ZEROS)
1760  006626  005612                          $TYPON  ;;CALL=TYPON    TRAP+4(104404)  TYPE OCTAL NUMBER (AS PER LAST CALL)
1761
1762  006630  006054                          $GTSWR  ;;CALL=GTSWR    TRAP+5(104405)  GET SOFT-SWR SETTING
1763
1764  006632  006004                          $CKSWR  ;;CALL=CKSWR    TRAP+6(104406)  TEST FOR CHANGE IN SOFT-SWR
1765  006634  006266                          $RDCHR  ;;CALL=RDCHR    TRAP+7(104407)  TTY TYPEIN CHARACTER ROUTINE
1766  006636  006406                          $RDLIN  ;;CALL=RDLIN    TRAP+10(104410) TTY TYPEIN STRING ROUTINE
1767  006640  005015  047531  020125  MESS1:  .ASCIZ  <15><12>'YOU ARE ON AN XOR TESTER'<15><12>
1768  006646  051101  020105  047117
1769  006654  040440  020116  047530
1770  006662  020122  042524  052123
1771  006670  051105  005015     000
1772  006675     105  042116  050040  MESS3:  .ASCIZ  /END PASS/<15><12>
1773  006702  051501  006523  000012
1774          000001                          .END
```

```
ASCNT   004624          1263*   1287*   1294*   1298*   1309#
BEGIN   002010           839     845     847#   1344
BINCT   004622          1260*   1279*   1282*   1283    1286*   1308#
BIT0  = 000001           416#
BIT00 = 000001           406#    416
BIT01 = 000002           405#    415
BIT02 = 000004           404#    414
BIT03 = 000010           403#    413
BIT04 = 000020           402#    412
BIT05 = 000040           401#    411
BIT06 = 000100           400#    410
BIT07 = 000200           399#    409
BIT08 = 000400           398#    408
BIT09 = 001000           397#    407
BIT1  = 000002           415#
BIT10 = 002000           396#
BIT11 = 004000           395#
BIT12 = 010000           394#
BIT13 = 020000           393#
BIT14 = 040000           392#
BIT15 = 100000           391#
BIT2  = 000004           414#
BIT3  = 000010           413#
BIT4  = 000020           412#
BIT5  = 000040           411#
BIT6  = 000100           410#
BIT7  = 000200           409#
BIT8  = 000400           408#
BIT9  = 001000           407#
BPTVEC= 000014           423#
BUFTST  002244           895#
CKSWR = 104406           843     1181    1199    1216    1247    1321    1330    1398    1402    1764#
COUNT   001242           735#
CR    = 000015           331#    1487    1497
CRLF  = 000200           332#     776    1458    1497
CSR   = 167770           301#     713     714     715     716
DOISP = 177570           338#     747
DECML   004616          1265*   1278    1284*   1306#
DISPLA  001220           724#    747*    755*
DISPRE  000174           703#    755
DRBHIO  001230           728#    923*    933*    934*
DRCSR   001222           725#    830     847    1082*   1083*   1093*   1094*   1103*   1104*   1114*   1115*   1125*   1126*
                        1128*   1137*   1138*   1140*   1150*   1151*   1153*   1163*   1164*   1165*   1190    1354
DRIBUF  001226           727#    873    1013    1019    1028    1040*   1041
DRLVL   001234           731#   1064    1078*   1171
DROBUF  001224           726#    851*    853     863*    864     871*    879*    880     886*    887     914*    915*    916
                         922*    924     932*    936    1012*   1013*   1018*   1019*   1020    1027*   1028*   1029    1034*
                        1039*   1040
DRVECA  001232           730#   1058*   1064*   1080*   1091*   1101*   1112*   1123*   1135*   1148*   1161*   1171*   1172*
                        1359
DRVECB  001236           732#   1070*
DSWR  = 177570           337#    746
EMTVEC= 000030           426#
END     003750          1175#
END1    004122          1206    1212#
ERRVEC= 000004           419#    744     745*    756*
```

```
FIRST   001632            807    810    812#
GNS   = ****** U          775   1757   1758   1759   1760   1762   1764   1765   1766
GTSWR = 104405            770   1762#
HDFHM   004602           1299   1301#
HLT   = 104000            300#   855    857    867    875    883    890    905    919    927    938    948    953
                          961    967    974    982    986    994   1002   1008   1015   1022   1031   1044   1052
                         1062   1074   1085   1096   1106   1117   1130   1142   1155   1168
HT    = 000011            329#  1456   1497
ICOUNT  004766            850*   862*   870*   878*   894*   956*   997*  1025*  1037*  1335   1342#
IOTVEC= 000020            424#
LF    = 000012            330#  1491   1497
LIST    004626           1262   1310#
MESS1   006640            822   1767#
MESS3   006675           1203   1772#
MINUS   004424           1269   1272#
MKNUM   004454           1278#  1281
MOADD   004536           1290#  1292
MOREID  005010            846   1241   1351#
PASCNT  001246            737#  1204*  1333
PFAIL   005124            692   1374#
PIRQ  = 177772            336#
PIRQVE= 000240            430#
PL      001244            736#  1078
PRTAB   004344           1235   1240   1260#  1355   1360
PR0   = 000000            353#
PR1   = 000040            354#
PR2   = 000100            355#
PR3   = 000140            356#
PR4   = 000200            357#
PR5   = 000240            358#
PR6   = 000300            359#
PR7   = 000340            360#
PS    = 177776            333#   334
PSW   = 177776            299#   334#   848#   978#   989#  1056#  1060#  1069#  1072#  1079#  1089#  1090#  1099#
                         1100#  1110#  1111#  1121#  1122#  1134#  1146#  1147#  1159#  1160#  1317#
PWRVEC= 000024            425#
RCSR    001200            713#   789#   829   1407
RCSR1   001210            717#   795#   796#   797#   798#   799#  1417
RDCHR = 104407           1698   1765#
RDLIN = 104410           1766#
RESTAR  005162           1382   1385#
RESVEC= 000010            420#
RETURN  004772            839*  1318   1340*  1344#
RSTART  001754            838#  1184   1198   1393
SAVCC   004342           1221*  1239   1258#
SAVPC   004340           1220*  1234   1257#
SAVR2   004326           1231*  1242   1252#
SAVR3   004330           1232*  1243   1253#
SAVR4   004332           1233*  1244   1254#
SAVR6   005160           1381*  1384#  1385
SCOPEA  004760           1332   1334   1340#
SCOPEB  004640           1316#  1323   1338   1349
SCOPEF  004770            840*  1335   1337*  1339*  1343#
SCOPEG  004754           1336   1339#
SEVEN   004614           1264*  1273   1284   1290*  1305#
SPEC    001616            707    809#
```

```
SPEC0   005212          811    1397#
SPEC1   005246          818    1400    1407#
SPEC2   005276          820    1404    1417#
STACR = 001200          324#    741     809     838     858    1057    1068    1081    1092    1102    1113    1124    1136
                       1149    1162
STAR    004432         1271    1273#   1293
START   001726          708     808     829#   1212    1405
START1  001250          706     739#
STKLMT= 177774          335#
SWR     001216          723#    746*    748     754*    768     844    1182    1200    1217    1248    1322    1331    1399
                       1403    1595    1632*
SWREG   000176          704#    754     768    1595    1608
SW0   = 000001          388#
SW00  = 000001          378#    388
SW01  = 000002          377#    387
SW02  = 000004          376#    386
SW03  = 000010          375#    385
SW04  = 000020          374#    384
SW05  = 000040          373#    383
SW06  = 000100          372#    382
SW07  = 000200          371#    381
SW08  = 000400          370#    380
SW09  = 001000          369#    379
SW1   = 000002          387#
SW10  = 002000          315#    368#   1182
SW11  = 004000          316#    367#   1331
SW12  = 010000          366#
SW13  = 020000          317#    365#   1217
SW14  = 040000          318#    364#   1322
SW15  = 100000          363#
SW2   = 000004          386#
SW3   = 000010          385#
SW4   = 000020          384#
SW5   = 000040          383#
SW6   = 000100          382#
SW7   = 000200          381#
SW8   = 000400          380#
SW9   = 001000          314#    379#    844    1200
TAG     002310          914#
TBITVE= 000014          421#
TCSR    004336         1176    1179    1223    1226    1229    1237    1256#   1266    1295    1301    1352    1357    1362
                       1365    1368
TDBR    004334         1175*   1178*   1225*   1228*   1236*   1255#   1270*   1272*   1297*   1351*   1356*   1361*   1364#
                       1367#
TINT1   003252         1080    1086#
TINT2   003322         1091    1098#
TINT3   003372         1101    1108#
TINT4   003442         1112    1118#
TINT5   003522         1123    1131#
TINT6   003572         1135    1142#
TINT7   003652         1148    1155#
TINT8   003732         1161    1168#
TKVEC = 000060          428#
TOODLE  004612         1274*   1275*   1276    1304#
TPVEC = 000064          429#
TRAPVE= 000034          427#
```

```
TRTVEC= 000014            422#
TST4    003132           1058    1063#
TST5    003202           1070    1075#
TST6    002760           1027#   1035
TST9    003014           1033    1036#
TYP     005316            696    1426#
TYPE  = 104401            764     821    1202    1461    1566    1606    1607    1610    1623    1634    1653    1702    1705
                         1709    1757#
TYPOC = 104402           1609    1758#
TYPON = 104404           1760#
TYPOS = 104403           1759#
WAIT1   004402           1266#   1267
WAIT2   004560           1295#   1296    1300
WGTCT   004620           1261*   1278*   1280    1285*   1307#
WRTOC   004474           1277    1282#
XLIST   004552           1288    1294#
XOR     005000           1327    1347#
XORA    001712            813     824#
XORFLG  001240            733#    816*    826*   1324
$AUTOB  006560            772*   1603    1724#
$CHARC  005532           1463*   1473*   1480    1489*   1494#
$CKSWR  006004           1595#   1764
$CMTAG= ****** U          741
$CNTLG  006531           1606    1719#
$CNTLU  006524           1623    1718#
$CRLF   005547           1462    1504#   1634    1718
$ENDAD  004112            699    1208#
$FILLC  005544           1466    1501#
$FILLS  005543           1500#
$GTSWR  006054           1607#   1762
$INTAG  006561           1635    1725#
$LF     005550           1505#   1709    1718
$MAIL = ****** U          758     768    1450
$MNEW   006547           1610    1722#
$MSWR   006536           1607    1720#
$NULL   005542           1468    1499#
$OCNT   005774           1538*   1567*   1580#
$OMODE  005776           1533*   1537*   1542    1545*   1556*   1582#
$QUES   005546           1503#   1653    1702    1718
$ROCHR  006266           1666#   1765
$RODEC= ****** U          1767
$ROLIN  006406           1694#   1766
$RODCT= ****** U          1767
$ROSZ = 000010           1687#
$R2A  = ****** U          1767
$SAVRE= ****** U          1767
$SETUP= 000100            431#    742     764     765    1590    1724
$STUP = 177777            431#
$TKB    006002           1587#   1599    1616    1670    1676
$TKS    006000           1586#   1597    1613    1637*   1668    1674
$TPB    005540           1486*   1498#
$TPFLG  005545           1444    1502#
$TPS    005536           1484    1497#
$TRAP   006562           1734#
$TRAP2  006604           1745#   1756
$TRP  = 000011           1733#   1758#   1759#   1760#   1761#   1762    1763#   1764    1765#   1766#   1767#
```

```
$TRPAD  006616          1739    1756#
$TTYIN  006514          1695    1696    1713    1717#
$TYPBN= ****** U        1761
$TYPDS= ****** U        1761
$TYPE   005316          1444#   1749    1757
$TYPEC  005466          1465    1472    1479    1484#   1485    1639
$TYPEX  005534          1490    1492    1495#
$TYPOC  005576          1536#   1758
$TYPON  005612          1535    1538#   1760
$TYPOS  005552          1531#   1759
$OFILL  005775          1532*   1536*   1546    1581#
.       = 006710         432#    433     435     437     439     441     443     445     447     449     451     453     455
                         457     459     461     463     465     467     469     471     473     475     477     479     481
                         483     485     487     489     491     493     495     497     499     501     503     505     507
                         509     511     513     515     517     519     521     523     525     527     529     531     533
                         535     537     539     541     543     545     547     549     551     553     555     557     559
                         561     563     565     567     569     571     573     575     577     579     581     583     585
                         587     589     591     593     595     597     599     601     603     605     607     609     611
                         613     615     617     619     621     623     625     627     629     631     633     635     637
                         639     641     643     645     647     649     651     653     655     657     659     661     663
                         665     667     669     671     673     675     677     679     681     683     685     687     689#
                         698#    700#    702#    705#    709#    866     874     882     889     904     918     926     937
                         947     952     960     966     973     981     985     993     1001    1007    1014    1021    1030
                        1043    1051    1141    1154    1167    1218    1224    1227    1230    1238    1249    1302    1353
                        1358    1363    1366    1369    1497    1498    1499    1500    1501    1502    1503    1504    1505
                        1506    1586    1587    1717#   1718    1724    1725    1726
.HLT    004126           694    1216#
.SCOPE  004652           690    1321#

. ABS.  006710      000

ERRORS DETECTED:  0
DEFAULT GLOBALS GENERATED:  0

DZDRCG,DZDRCG=SYSMAC.SML,DZDRCG.P11
RUN-TIME:  13  9  .4 SECONDS
RUN-TIME RATIO:  159/23=6.7
CORE USED:  32K  (64 PAGES)
```